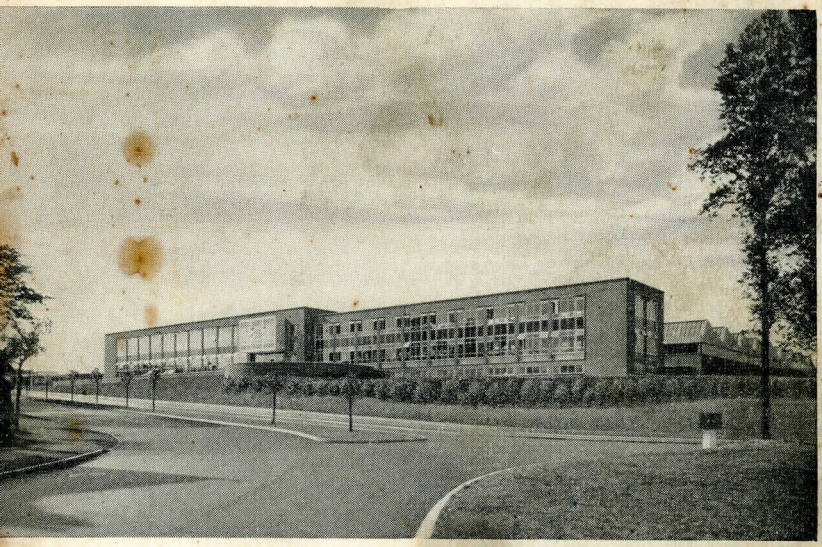
*World Renowned*

# M & W

**MOORE & WRIGHT (SHEFFIELD) LTD.**

PRECISION AN HAND TOOLS

MOORE & WRIGHT (SHEFFIELD) LTD.
HANDSWORTH ROAD SHEFFIELD 13



*View of the offices with the Factory visible in the background*


**MOORE & WRIGHT (SHEFFIELD) LTD**

**HANDSWORTH ROAD**

**SHEFFIELD 13**

**ENGLAND**

*TELEPHONE Nos. 49191/2/3/4*

*TELEGRAMS : "MOORITE, SHEFFIELD, 13"*



WELHAMS
HARDWARE STORES
TRAFFORD ROAD, SALFORD
IRONMONGERY & TOOLS

**CATALOGUE No. 61**

*This Catalogue is issued by*

# MOORE & WRIGHT (SHEFFIELD) LTD.

**Controlled by JOHN SHAW & SONS (Wolverhampton) LTD.**

Every tool bearing any of our marks, i.e.

**"MOORE & WRIGHT," "MOORITE," "SAFE & SURE,"**

**"BRITAIN'S TOOL FACTORY," or** (M&W)

carries our full guarantee to do the work for which it was designed and sold, but if it should fail to do so, it will be exchanged or rectified free of charge if returned carriage paid to our address in Sheffield.

This guarantee does not cover any liability beyond the replacement of the defective tool concerned, and no claim for personal injury, or injury or loss to third parties will be deemed to be within the scope of this guarantee.

**THE ABOVE GUARANTEE does not apply to any article on which any name or mark has been struck by the purchaser, or which has been abused. Nor does it apply to goods which are worn by usage, but where any defect is present we will put them in working order, if possible.**

The prices given in the Price List are the retail prices at which the goods can be bought from any Tool Dealer or Ironmonger in Great Britain, subject to current advances. On receipt of a postcard we will give the name of your nearest dealer carrying our stocks.

Cases charged at cost and full value allowed if returned carriage paid.

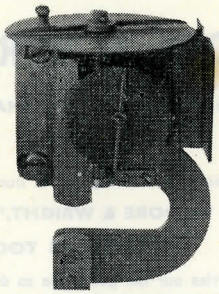
Carriage Paid on lots of £30 net value or over in Great Britain.

We reserve the right to alter the design or price of any article without notice.

1st EDITION, JANUARY 1961

# HISTORICAL

The Micrometer was invented by James Watt in 1819, who felt the need of a more accurate measuring instrument than was obtainable at that time. A model of this Micrometer is to be seen in the South Kensington Science Museum



*JAS. WATT'S MICROMETER*

As has happened in so many other inventions the development of the idea took place in other countries, and at the time we began the manufacture of these tools the trade was in the hands of foreign firms. We had been studying the weaknesses and drawbacks of the prevailing article for many years, and were impressed with the fact that most foreign Micrometers were fitted with unhardened screws with the attendant rapid wear, need of constant adjustment, and final inaccuracy. **We, therefore, decided to make a screw of one piece of hardened steel, with the threads ground after hardening, with all the internal strains of the steel released.**

These screws are an enormous advance on those produced by any other method than grinding, and Micrometers fitted with them represent the greatest advance made in tools of this kind.

Only the finest quality materials are used for (M&W) micrometers and the best grade for each component is carefully chosen to give long life and reliability. In manufacture, care is taken at every stage of production to build precision and lasting accuracy into every instrument.

**ALL MICROMETERS IN THIS CATALOGUE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# ABOUT MICROMETERS

MOORE & WRIGHT Micrometers are made in a special factory built for the purpose.

The machines used in the production of M. & W. micrometer screws are of special design and are the most accurate obtainable. If and when better machines can be had, we shall have them.

We guarantee every micrometer to be of the highest grade of accuracy, and to conform in every respect to the standards set by the British Standard Institution Specifications.

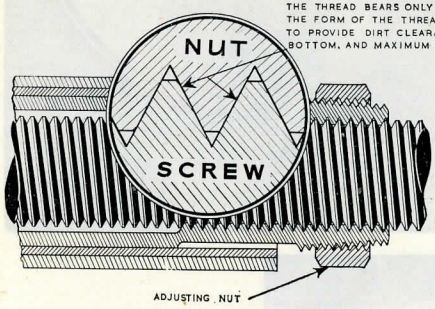
The salient points to which we wish to draw attention are the following :

## SPINDLE

The Spindle is made from **one piece** of special alloy tool steel, hardened throughout, and special attention is paid to "ageing" to avoid distortion and subsequent error. **The screw threads are ground out of the solid bar, after hardening to the required degree, placing M. & W. Micrometers in the very highest class.**

## SCREW ACCURACY

The accuracy and long life of a screw depends on the flanks of the thread. We, therefore, ignore both the crest and the bottom of the thread and concentrate on the accuracy of the flanks. The illustration below will show why this construction is the best.




This form of thread besides ensuring the minimum wear and maximum life, makes adequate provision for lubricating oil to be retained in the clearance shown on the top and bottom of each thread. Pieces of grit and dirt which get into the screw quickly find their way into the clearance and smoother running is ensured.

## MAIN NUT AND ADJUSTING NUT

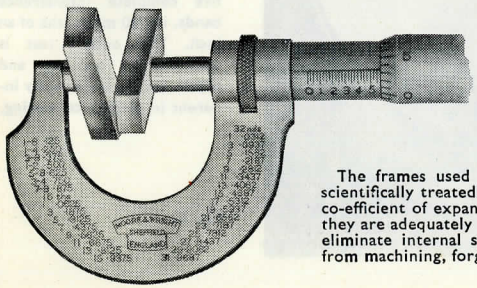
The main nut is so placed, that when adjusted, the maximum number of threads are in contact.

## ACCURACY OF SPINDLE AND ANVIL FACES

The importance of accuracy at these two points is quite as great as the accuracy of the pitch, and we refer you to page 4 for one of our methods of checking.

## FLATNESS OF ANVILS, Etc.

Standard Reference type gauge blocks are by common consent acknowledged to be the most accurate flat surfaces produced, and this flatness is demonstrable by the fact that they will wring together, i.e. due to the extreme flatness of the surfaces all air is excluded and the blocks will adhere together.



The anvil and spindle faces of M. & W. micrometers **will wring to gauge blocks** as shown in the illustration left.

**All anvil and spindle faces are inspected for flatness and parallelism by the most up-to-date optical methods.**

The frames used in M. & W. micrometers are scientifically treated to ensure their having a low co-efficient of expansion, and during manufacture they are adequately rested between operations to eliminate internal strains which are inseperable from machining, forging or casting.

# HOW M&W MICROMETERS ARE TESTED

The Spindle and Anvil face on all M. & W. Micrometers are inspected for flatness by optical parallels, i.e. by using the system of light interference. When the face being tested shows no coloured bands through the optical parallel (as illustrated in Fig. 1), then it is a true plane surface.

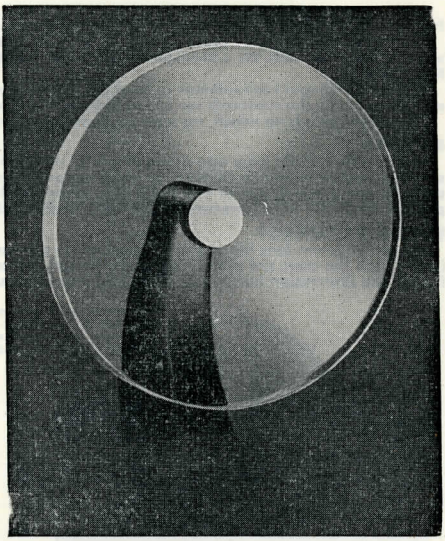
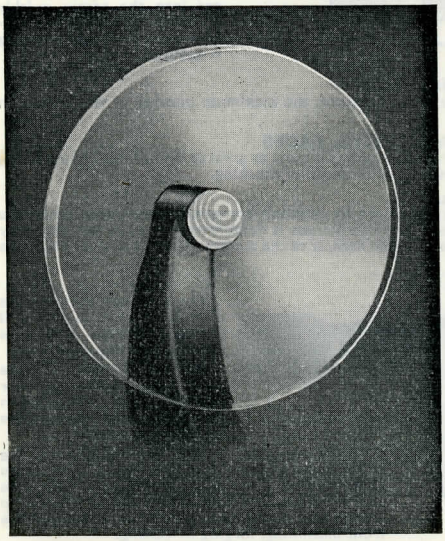


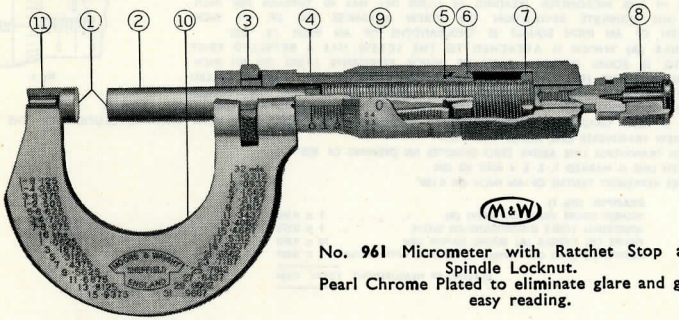
*Fig.* 1



When, however, the Anvil or Spindle face shows a series of coloured bands, it is positive evidence that the face deviates from true planeness, Fig. 2. The number of bands or circles is in proportion to its inaccuracy. No face is passed as flat which shows more than five complete interference bands, i.e. 50 millionths of an inch. This optical test is positive and accurate and eliminates the uncertainty inherent in mechanical testing.

***Fig.* 2**

# SECTION SHOWING PRINCIPAL POINTS OF A MOORE & WRIGHT MICROMETER




No. **961** Micrometer with Ratchet Stop and Spindle Locknut.
Pearl Chrome Plated to eliminate glare and give easy reading.

1. **Spindle and Anvil Faces**—Glass hard and optically flat, also available with TUNGSTEN CARBIDE faces.
2. **Spindle**—One piece of special alloy steel, hardened throughout, integral with thread ground screw.
3. **Locknut**—Gives positive locking at any reading. Does not push spindle over to one side.
4. **Sleeve**—Adjustable for zero setting. Accurately and clearly divided and marked, Pearl chrome plated.
5. **Main Nut**—Maximum number of threads ensures correct engagement with screw.
6. **Screw Adjusting Nut**—For quick easy adjustment of main nut.
7. **Thimble Adjusting Nut**—Controls setting of thimble.
8. **Ratchet Stop**—Improved design ensures constant "FEEL".
9. **Thimble**—Accurately and clearly divided, numbered every graduation, Pearl chrome plated.
10. **Steel Frame**—Marked with decimal equivalents of 8ths, 16ths, 32nds and 64ths. Pearl chrome plated.
11. **Anvil End**—Narrow tapered frame permits measurement in deep slots.

**THE OUTSTANDING FEATURES OF (M&W) MICROMETERS ARE :**

- **ACCURACY**—Every Micrometer conforms to *British Standard Specification.*
- **SPINDLE**—Special Alloy Steel hardened throughout, integral with perfectly designed thread ground screw.
- **MEASURING FACES**—Glass hard and optically flat.
- **ADJUSTMENT**—Large range of adjustment for wear zero setting, etc. (*See "Care and Adjustment" below*).
- **EASY READING**—Thimbles and sleeves are accurately and clearly divided and marked having a Pearl chrome finish to eliminate glare.

## THE CARE AND ADJUSTMENT OF (M&W) MICROMETERS

The life of a micrometer (i.e. the time it remains active) depends on the treatment it receives. It should, therefore, be kept clean at all times, especially when taking measurements see that no dirt is between the micrometer faces.

Do not force the screw too hard on to any surface, but by using the ratchet ensure an even pressure.

The adjustment of (M&W) Micrometers is made by means of a spanner which is supplied.

- **Looseness in the screw** is taken up by a slight turn of the screw adjusting nut.
- **Error in Zero Setting** is adjusted by first ensuring the anvil and spindle faces are clean. Then bringing them together carefully, and then by means of the spanner turn the sleeve until zero lines on thimble and sleeves are coincident.

# HOW TO READ MICROMETERS.

## (1) READING IN THOUSANDTHS OF AN INCH. (1/1,000")

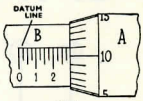


Fig 1.

A MICROMETER IS A GAUGE OPERATED BY A SCREW.
THE SCREW IN THIS MICROMETER (READING IN 1/1,000 IN.) HAS 40 THREADS PER INCH. THUS, IN ONE COMPLETE REVOLUTION THE SCREW ADVANCES 1/40 OF AN INCH. ONE FORTIETH OF AN INCH EQUALS 25 THOUSANDTHS OF AN INCH, I.E. .025".
THE **THIMBLE (A)** WHICH IS ATTACHED TO THE SCREW HAS A BEVELLED EDGE DIVIDED INTO 25 EQUAL DIVISIONS, EACH OF WHICH REPRESENTS 1/1,000 OF AN INCH. ON THE INNER **SLEEVE (B)** A LINE PARALLEL TO THE AXIS IS CUT, THIS IS CALLED THE DATUM LINE, AND WHEN THE MICROMETER IS CLOSED THE LINE ON THE THIMBLE MARKED "O" COINCIDES WITH IT. THIS IS ZERO, AND ALL MEASUREMENTS ARE CALCULATED FROM IT.
THE SLEEVE IS ALSO GRADUATED WITH A NUMBER OF TRANSVERSE LINES, AND WITH EACH REVOLUTION OF THE THIMBLE A NEW TRANSVERSE LINE COMES INTO VIEW.
I.E. EACH TRANSVERSE LINE ABOVE ZERO DENOTES AN OPENING OF .025"
EVERY FOURTH LINE IS MARKED 1, 2, 3, 4 AND SO ON.
THESE FIGURES REPRESENT TENTHS OF AN INCH OR 0.100"

**EXAMPLE (Fig. 1).**

| | |
|---|---|
| HIGHEST FIGURE VISIBLE ON SLEEVE (B) | 2 = 0.200" |
| ADDITIONAL VISIBLE SUB-DIVISIONS ON SLEEVE | 3 = 0.075" |
| FIGURE ON THIMBLE (A) BEFORE DATUM LINE | 10 = 0.010" |
| ADDITIONAL LINES ON THIMBLE COINCIDING WITH DATUM | 1 = 0.001" |
| READING OF MEASUREMENT TOTAL | 0.286" |

## (2) READING IN TEN THOUSANDTHS OF AN INCH. (1/10,000")

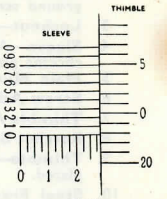


Fig 2.

THIS (M&W) MICROMETER IS EXACTLY AS ABOVE (I.E. 40 T.P.I. SCREW ETC.) BUT WITH THE ADDITION OF A VERNIER ON THE SLEEVE, AGAIN READING IN CONJUNCTION WITH THE THIMBLE
**ON THE SLEEVE,** PARALLEL TO THE AXIS (DATUM LINE) ARE GRADUATED 10 DIVISIONS WHICH OCCUPY THE SAME SPACE AS 9 DIVISIONS ON THE THIMBLE
IT WILL BE OBVIOUS THEREFORE THAT THE DIFFERENCE IN WIDTH BETWEEN EACH DIVISION ON THE THIMBLE AND EACH DIVISION ON THE SLEEVE IS 1/10 OF A DIVISION. THE DIVISIONS ON THE THIMBLE BEING 1/1000", THE DIFFERENCE THEREFORE IS 1/10,000" WHEN THEREFORE, THE GRADUATED LINE ON THE THIMBLE (I.E. THE 1/1,000" LINE) DOES NOT EXACTLY COINCIDE WITH THE VERTICAL LINE ON THE SLEEVE, IT IS NECESSARY TO NOTE WHICH IS THE 1st VERNIER LINE COINCIDING EXACTLY WITH A GRADUATED LINE ON THIMBLE. THIS GIVES THE NUMBER OF 1/10,000's TO BE ADDED.

**EXAMPLE (Fig. 2).**

| | |
|---|---|
| HIGHEST FIGURE VISIBLE ON SLEEVE | 2 = 0.200" |
| ADDITIONAL VISIBLE SUB-DIVISIONS ON SLEEVE | 3 = 0.075" |
| FIGURE ON THIMBLE BEFORE DATUM LINE | 20 = 0.020" |
| ADDITIONAL LINES ON THIMBLE BEFORE DATUM LINE | 2 = 0.002" |
| VERNIER LINE COINCIDENT WITH LINE ON THIMBLE | 7 = 0.0007" |
| READING OF MEASUREMENT TOTAL | 0.2977" |

## (3) READING IN HUNDREDTHS OF A MILLIMETRE. (1/100 "/m)

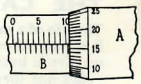


Fig. 3

THE SCREW IN THIS (M&W) MICROMETER IS ADAPTED TO METRIC MEASUREMENT AND HAS A PITCH OF 0.5 "/m. THUS, WITH ONE COMPLETE REVOLUTION THE SCREW ADVANCES 0.5 "/m.
THE **THIMBLE (A)** IS DIVIDED INTO 50 EQUAL DIVISIONS, EACH OF WHICH REPRESENTS 1/100 "/m.
THE **SLEEVE (B)** HAS THE USUAL DATUM LINE BUT WITH TRANSVERSE LINES EITHER SIDE OF THIS. EACH TRANSVERSE LINE REPRESENTS AN OPENING OF 0.5 "/m.
IT SHOULD BE NOTED, THAT THE TOP ROW OF GRADUATIONS REPRESENTS "/m AND ARE NUMBERED EVERY 5th GRADUATION, AND THE BOTTOM ROW SUB-DIVIDING THESE "/m GRADUATIONS REPRESENTS 0.5 "/m.

**EXAMPLE (Fig. 3).**

| | |
|---|---|
| HIGHEST FIGURE VISIBLE ON SLEEVE | 10 = 10.00 "/m |
| ADDITIONAL VISIBLE SUB-DIVISIONS ON SLEEVE | 1 = 0.50 " |
| FIGURE ON THIMBLE BEFORE DATUM LINE | 15 = 0.15 " |
| ADDITION LINES ON THIMBLE COINCIDING WITH DATUM | 1 = 0.01 " |
| READING OF MEASUREMENT TOTAL | 10.66 "/m |

# HOW TO READ A UNIVERSAL BEVEL PROTRACTOR

## METHOD OF READING

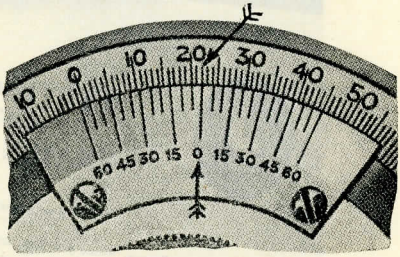



*Fig. 1*

Whole numbers of degrees can be read by simply taking readings with the zero line on the vernier. Where this line coincides with a line on the **Main Scale,** an exact number of whole degrees is indicated. This is illustrated in Fig. 1 where the reading is precisely 22°.

The Vernier on a Bevel Protractor enables readings to be taken to five minutes or 1/12th of a degree. One division on the Vernier is this amount shorter than two divisions on the Main Scale.

If the zero line on the **Vernier** does not coincide exactly with a line on the Main Scale, it is necessary to find the Vernier line which does coincide with a Main Scale line; and this indicates the number of five minutes or 1/12ths of a degree to be added to the number of whole degrees.

To take a reading, therefore, note the number of whole degrees, and then count in the same direction, the number of divisions on the Vernier Scale from the zero line to the first line on the Vernier Scale that coincides with a line on the Main Scale. As each of these is five minutes, multiply by five and the number of minutes to be added to the whole number of degrees will be indicated.

As an example take a reading of 17°–25′ (Fig. 2).

It will be noted that the **Vernier** zero line has moved 17° and part of a degree, in a clockwise direction, and that reading in the same direction the fifth line on the Vernier is coincident with a line on the **Main Scale.**

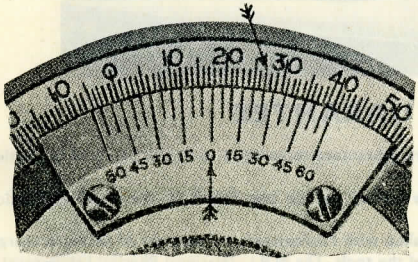
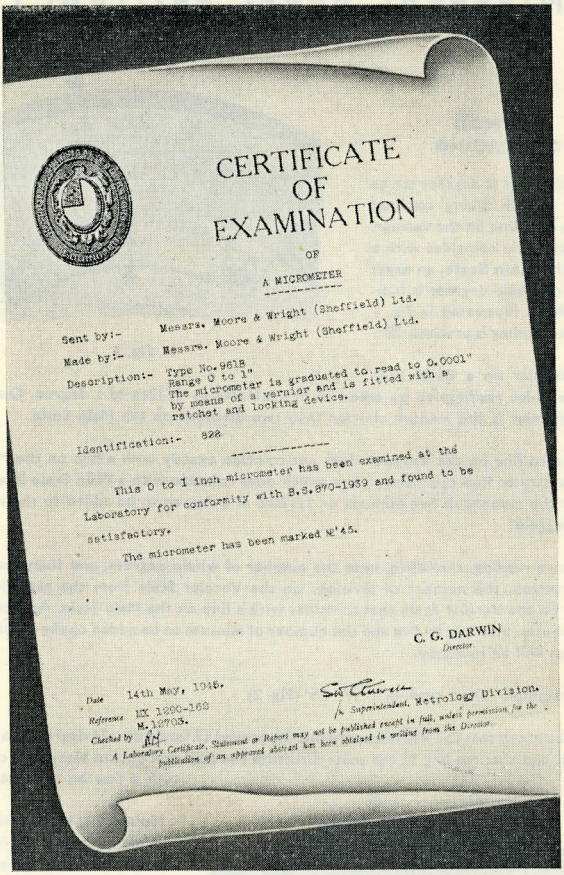



*Fig. 2*

Multiplying by five this gives 25 minutes to be added to the 17° already obtained. This gives a reading of 17°–25′.

It will be noted that readings can be taken in either direction, clockwise or anti-clockwise, and it is important that the readings are taken on the Main Scale and the Vernier Scale in the direction in which the Vernier line has moved.

# ILLUSTRATION OF N.P.L. CERTIFICATE



CERTIFICATE
OF
EXAMINATION

OF

A MICROMETER

Sent by:- Messrs. Moore & Wright (Sheffield) Ltd.

Made by:- Messrs. Moore & Wright (Sheffield) Ltd.

Description:- Type No.961B
Range 0 to 1"
The micrometer is graduated to read to 0.0001"
by means of a vernier and is fitted with a
ratchet and locking device.

Identification:- 828

This 0 to 1 inch micrometer has been examined at the Laboratory for conformity with B.S.870-1939 and found to be satisfactory.

The micrometer has been marked M'45.

C. G. DARWIN
Director

Date 14th May, 1945.
Reference MX 1800-160
M.10703.
Checked by AM

Superintendent, Metrology Division.

A Laboratory Certificate, Statement or Report may not be published except in full, unless permission for the publication of an approved abstract has been obtained in writing from the Director.

## GUARANTEE

Micrometers of our manufacture are guaranteed to conform to British Standard Institution Specifications.

Regular routine inspections are carried out on our behalf by the National Physical Laboratory.

N.P.L. Certificates will be furnished with Micrometers on payment of an extra charge, which is in addition to the prices of the tools. The N.P.L. (National Physical Laboratory) is the Standard Reference Authority for the verification of all instruments of precision.

# DATA SHEETS FOR ENGINEERING STUDENTS AND APPRENTICES

There are 20 numbered Sheets to the Set in blueprint form, 8″ × 10″ notebook size, and punched to fit a special binder which is also supplied, and into which loose-leaf notepaper can be fastened to make the binder into a very comprehensive notebook.

Other drawings will be made available later, and there is no doubt that if the folder is kept up to date, together with your own notes it will become a really valuable Compendium of Engineers' Precision Tools.

Single Sheets may be purchased if required.

The present set of blueprints cover the following :

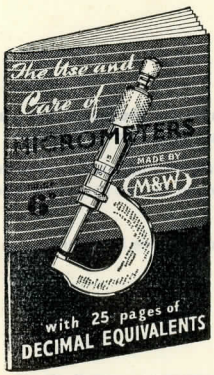
*Sheet No.*

1 External Micrometers.
2 How to read Micrometers.
3 Internal Micrometers.
4 Depth Gauge Micrometers.
5 Telescoping Gauges.
6 Universal Bevel Protractors.
7 How to read a Universal Bevel Protractor.
8 Bevels and Setting Protractors.
9 Combination Squares.
10 Engineers' Steel Try-Squares.
11 Adjustable Try-Square.
12 Universal Surface Gauges.

*Sheet No.*

13 V Blocks and Clamp.
14 Adjustable Micrometers.
15 Callipers and Dividers.

20 Drill Sizes.
21 Tapping and Clearance Drill Chart.
22 Equivalent Chart (Fractional, Decimal, Metric).
23 Equivalent Chart (Inches to Millimetres).
24 Equivalent Chart (Millimetres to Inches).




# DECIMAL EQUIVALENT BOOKLET WITH DETAILS OF MICROMETERS

This 44-page booklet gives hints on how to use, care for, and adjust micrometers, together with details of various types of (M&W) micrometers. There are also instructions on how to read micrometers.

There are 25 pages of decimal equivalents and details of wire gauge and drill sizes.

**A free copy of this booklet will be sent to you if you will send us your Tool Dealers' receipt indicating your purchase of 20/- worth, or more, of (M&W) tools.**

# CAN WE HELP YOU?

On the following pages you will find illustrated and/or described, **External Micrometers** with fixed anvils that can be used for almost any mechanical measuring job.

They range from the 0″– ½″ types to the 23″– 24″ types, and even larger sizes on application.

Also **Adjustable External Micrometers** with interchangeable or sliding anvils which provide alternative and extended ranges of measurement, the smallest being 0″– 2″ and the largest 66″– 72″.

Micrometers with **frames up to 2″, 4″ or 6″ in depth,** or more if required, are made to take measurements a distance from the edge of the job or material.

We make **Micrometer Heads** which can be used on most jigs, tools, machines or precision instruments.

Micrometers for taking **internal measurements** from 1″ to 48″.

All the above can be supplied with Metric graduations.

We make **Braille Micrometers** for use by the Blind and micrometers for special purposes. See pages 51 and 52.

★

# SERVICE DEPARTMENT

We have a fully-equipped Service Department for the repair and maintenance of Micrometers at reasonable rates. Estimates on request.

When replacement parts are required for any Micrometers it is essential that the complete tool be returned to the works for the part to be fitted, as only then can accuracy be ensured.

Standard Micrometer Key replacements can be made by return.

## ENGRAVING

Names, titles of firms, etc., etc., can be engraved on Micrometers at a small charge.

# ENGINEERS' PRECISION TOOL SECTION

SEE PAGE 13 FOR INDEX

FOR COMPLETE NUMERICAL INDEX
SEE PAGES 137-138

## IMPORTANT NOTICE

**ALL TOOLS IN THIS SECTION ARE MADE TO BRITISH STANDARD SPECIFICATION WHERE SUCH EXISTS**

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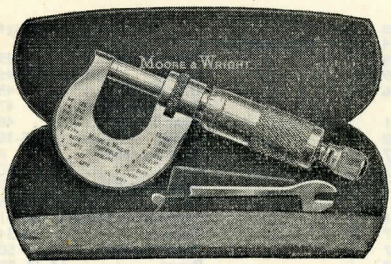
**FOR HAND TOOLS SEE INDEX ON PAGE 95**

# MICROMETERS WITH SMALL FRAMES




No. **933** As illustrated, with a capacity of 0–½″, graduated to read in 1/1000's of an inch. Fitted with a ratchet and locknut.

No. **933B** As above, but with a vernier sleeve graduated to read in 1/10,000's of an inch.

No. **933M** As No. 933, 0–13 mm. capacity. Graduated to read in 1/100's of a millimetre.

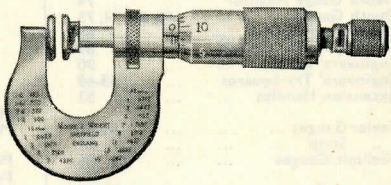
Decimal equivalents are engraved on all but "Metric" frames.

All the Micrometers in the ½″ range are supplied complete with setting keys in velvet-lined, leather-covered steel Cases.

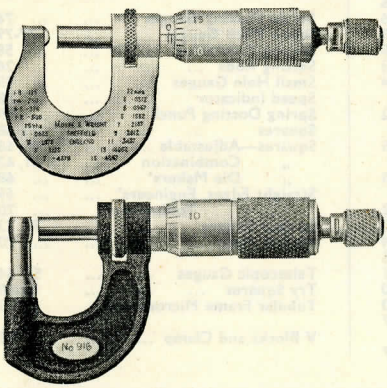
# MICROMETER
## FOR PAPER AND SOFT MATERIALS

No. **933P** This Micrometer is made with large flanges for measuring paper, cloth, silk, rubber, and any soft materials. It has a capacity of 0–⅜″, and is graduated to read in 1/1000's of an inch. Fitted with ratchet and locknut.

No. **933MP** As No. 933P, 0–9 mm. capacity. Graduated to read in 1/100's of a millimetre.



# TUBE MICROMETERS




No. **925** This is a Micrometer for measuring the thickness of tube walls. It has a capacity of 0–½″ and will enter a $\frac{5}{16}$″ diameter hole. Graduated to read in 1/1000's of an inch. Fitted with ratchet and locknut.

No. **925M** As No. 925, 0–13 mm. capacity. Graduated to read in 1/100's of a millimetre.

No. **933U** With ball anvil and spindle for curved articles with a capacity of 0–½″. Graduated to read in 1/1000's of an inch. (Made to order).

No. **933MU** As No. 933U, 0–13 mm. capacity. Graduated to read in 1/100's of a millimetre. (Made to order).

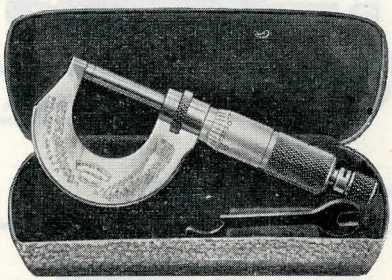
No. **916** This Micrometer for measuring the thickness of tube walls has a capacity of 0–½″ and will enter a $\frac{3}{32}$″ diameter hole. Graduated to read in 1/1000's of an inch. Fitted with ratchet and locknut.

No. **916M** As No. 916, 0–13 mm. capacity. Graduated to read in 1/100's of a millimetre.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH CUT-AWAY FRAMES

All Pearl chrome plated Micrometers of the 1" range now have a cut-away frame to facilitate measurement in awkward positions.



No. **961** As illustrated, with a capacity of 0–1", graduated to read in 1/1000's of an inch Fitted with ratchet and locknut. Every thousandth is marked on the thimble from 0–25.

No. **961M** As No. 961, 0–25 mm. capacity. Graduated to read in 1/100's of a millimeter.

No. **961D** As No. 961, but without the ratchet.

No. **961MD** As No. 961M, but without the ratchet.

No. **961E** As No. 961, but without the ratchet and the locknut.

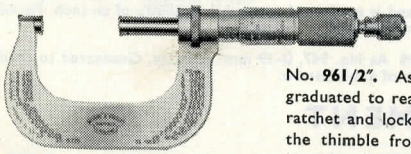
No. **961ME** As No. 961M, but without the ratchet and the locknut.

No. **961O** As No. 961, but without the locknut.

No. **961MO** As No. 961M, but without the locknut.

No. **961A** Exactly as No. 961, but graduated to read in half-thousandths.

No. **961B** Exactly as No. 961, but graduated to read in 1/10,000's of an inch by means of a vernier on the sleeve.



No. **961/2".** As illustrated with a capacity of 1–2", graduated to read in 1/1000's of an inch. Fitted with ratchet and locknut. Every thousandth is marked on the thimble from 0–25. Supplied in fitted wooden box complete with Setting Key.

No. **961B/2".** Exactly as No. 961/2", but graduated to read in 1/10,000's of an inch, by means of a Vernier on the sleeve.

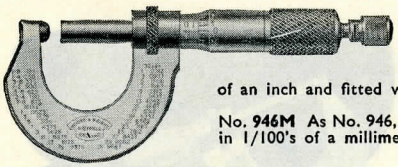
No. **961M/50 mm.** Exactly as No. 961/2", but graduated to read in 1/100's of a millimetre.

Decimal equivalents are engraved on all but Metric frames, and decimal equivalent cards are enclosed with all Micrometers.

All the Pearl chrome plated Micrometers in the 1" range are supplied complete with setting keys, in new, spring hinged pocket cases.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

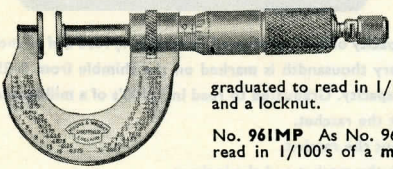
# TUBE MICROMETER
## WITH BALL ANVIL



No. **946** This is a Micrometer for measuring the thickness of tube walls. It has a capacity of 0–1″ and will enter a ⅜″ diameter hole. Graduated to read in 1/1000's of an inch and fitted with a ratchet and a locknut.

No. **946M** As No. 946, 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.

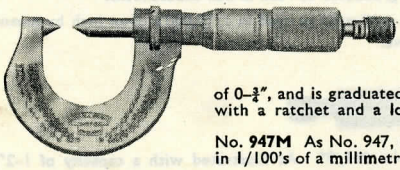
# MICROMETER
## FOR PAPER AND SOFT MATERIALS



No. **961P** This Micrometer is made with large flanges for measuring paper, cloth, silk, rubber and any soft material. It has a capacity of 0–⅝″, and is graduated to read in 1/1000's of an inch. Fitted with a ratchet and a locknut.

No. **961MP** As No. 961P, 0–22 mm. capacity. Graduated to read in 1/100's of a millimetre.

# MICROMETER
## WITH POINTED ANVIL AND SPINDLE

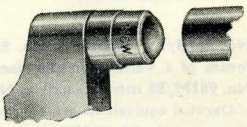


No. **947** This Micrometer is similar to No. 961, except that it has a pointed anvil and spindle to allow for the measuring of fluted articles. It has a capacity of 0–¾″, and is graduated to read in 1/1000's of an inch. Fitted with a ratchet and a locknut.

No. **947M** As No. 947, 0–19 mm. capacity. Graduated to read in 1/100's of a millimetre.

# BALL ATTACHMENT

The above device is for attaching either to the spindle or the anvil of our standard Micrometers. Either one or two attachments can be used at once. The ball is hardened and is ·250″ in diameter, which of course must be deducted from the actual measurement given by the Micrometer reading. The ball is movable in the cage to ensure a perfect contact with the anvil or spindle.



The ball in No. **878M** (Metric) is 6·5 mm. diameter.

No. **878** Fitting Spindles 6·8 mm. diameter. No. **878M** Fitting Spindles 6·8 mm. diameter.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH TUNGSTEN-CARBIDE TIPS

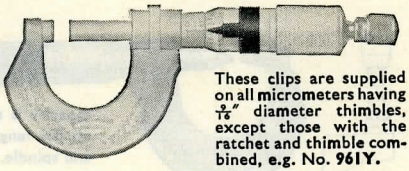
Any Standard Flat Anvil Micrometer 1" and upwards, and Micrometer Heads can be fitted with Tungsten-Carbide Tips at an extra charge.

Prices apply only to Standard Micrometers having flat anvils and spindle ends. For other shapes, conical, set-down, etc., special quotations will be given.

*NOTE.*—When Micrometers with tips are ordered, place 1 before the number, e.g. No. **961** with T.C. tips becomes **1961.**

# INDICATING CLIP
## FOR MICROMETER THIMBLE

No. **877** This Indicating Clip shown on the thimble is an extremely useful attachment to any Micrometer. It avoids confusion and eye-strain and ensures instantaneous reading.



These clips are supplied on all micrometers having $\frac{9}{16}$" diameter thimbles, except those with the ratchet and thimble combined, e.g. No. **961Y.**

# MICROMETER
## WITH LARGE THIMBLE

Any Standard External Micrometer 1" and upwards can be supplied with a $1\frac{3}{8}$" diameter thimble instead of the normal $\frac{9}{16}$" diameter, at extra cost.

When Micrometers with large thimbles are ordered place "L" before the number, e.g. No. **961** with $1\frac{3}{8}$" thimble becomes **L961.**

# MICROMETER
## WITH RATCHET AND THIMBLE COMBINED

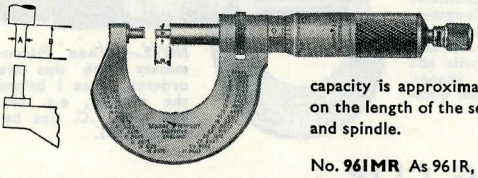
No. **961Y** This new Micrometer (British Patent 766356) features the latest form of ratchet which is built into the upper part of the thimble. It is designed for quick, easy and accurate one hand use. A knurled collar on the lower part of the thimble gives direct feel if required, also designed for easy one hand use.

This new ratchet stop feature can be supplied to order on other Moore & Wright external micrometers having larger capacities, and with $\frac{9}{16}$" diameter thimbles.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARLCHROME PLATED FOR EASY READING**

# MICROMETERS

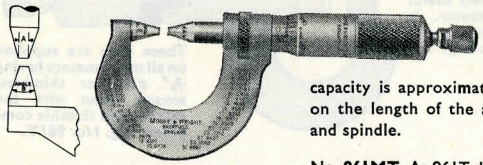
## WITH SPECIALLY SHAPED ANVIL OR SPINDLE ENDS



When ordering specify sizes A and B.

No. **961R** Fitted with ratchet and locknut and graduated to read in 1/1000's of an inch. The capacity is approximately 0–¾", but this depends on the length of the setdown portions of the anvil and spindle.

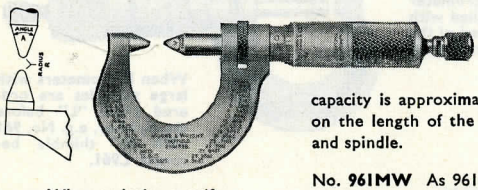
No. **961MR** As 961R, but the capacity is 0–19 mm. Graduated to read in 1/100's of a millimetre.



When ordering specify size A and angle B.

No. **961T** Fitted with ratchet and locknut and graduated to read in 1/1000's of an inch. The capacity is approximately 0–¾", but this depends on the length of the angles formed on the anvil and spindle.

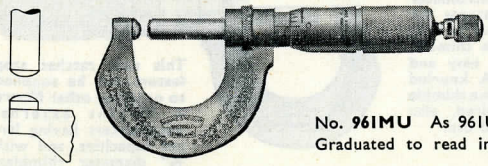
No. **961MT** As 961T, but the capacity is 0–19 mm. Graduated to read in 1/100's of a millimetre.



When ordering specify angle A. and radius "R"

No. **961W** Fitted with ratchet and locknut and graduated to read in 1/1000's of an inch. The capacity is approximately 0–¾", but this depends on the length of the angles formed on the anvil and spindle.

No. **961MW** As 961W, but the capacity is 0–19 mm. Graduated to read in 1/100's of a millimetre.



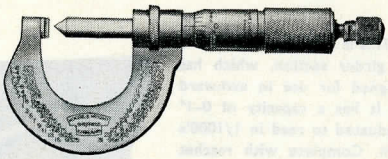
No. **961U** With a capacity of 0–1". Graduated to read in 1/1000's of an inch. Complete with ratchet and locknut.

No. **961MU** As 961U, but 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# SCREW THREAD MICROMETERS

For measuring effective diameters



## FOR WHITWORTH (55° Angle) THREADS

| No. | Capacity Inches | Range | No. | Capacity Inches | Range | No. | Capacity Inches | Range |
|---|---|---|---|---|---|---|---|---|
| **450** | 0–1 | 48 to 64 Threads | **454** | 0–1 | 22 to 30 Threads | **457** | 1–2 | 8 to 13 Threads |
| **452** | 0–1 | 8 to 13 „ | **455** | 0–1 | 32 to 40 „ | **458** | 1–2 | 14 to 20 „ |
| **453** | 0–1 | 14 to 20 „ | **456** | 1–2 | 4½ to 7 „ | **459** | 1–2 | 22 to 30 „ |

**These micrometers are made in the same ranges as above for AMERICAN (60° Angle) THREADS (United States Standard) except for No. 450 U.S.S. which has a range of 44 to 64 Threads.**

**When ordering add U.S.S. to the Catalogue No., viz.: No. 450 U.S.S.**

**These U.S.S. micrometers are also suitable for UNIFIED THREADS.**

## FOR B.A. THREADS

| No. | Capacity Inches | Range | No. | Capacity Inches | Range |
|---|---|---|---|---|---|
| **671** | 0–1 | 0, 1, 2 B.A. | **673** | 0–1 | 6, 7, 8 B.A. |
| **672** | 0–1 | 3, 4, 5 „ | **674** | 0–1 | 9, 10 „ |

The 1" are supplied with Pearl chrome plated frames, the 2" are supplied with black enamelled frames. Locknuts are not supplied on the 1"–2" sizes.

Any of the above Micrometers can be supplied in Metric Reading capacity. When ordering please add the letter "M" to the number, e.g. 450M.

## FOR METRIC THREADS

| No. | Capacity mm. | Range | No. | Capacity mm. | Range | No. | Capacity mm. | Range |
|---|---|---|---|---|---|---|---|---|
| **675** | 0–25 | 0·4 to 0·6 incl. | **677** | 0–25 | 1·0 to 1·75 incl. | **680** | 25–50 | 1·75 to 3·0 incl. |
| **676** | „ | 0·6 „ 1·0 „ | **678** | „ | 1·75 „ 3·0 „ | **681** | „ | 3·0 „ 5·0 „ |
| | | | **679** | 25–50 | 1·0 „ 1·75 „ | | | |

The 0·25 mm. are supplied with Pearl chrome plated frames, the 25-50 mm. are supplied with black enamelled frames. Locknuts are not supplied on the 25-50 mm. sizes.

**Screw Thread Micrometers have the end of the spindle pointed and the anvil of V form. When in use only the angle of the point and the sides of the V anvil contact the thread. Thus the effective diameter is measured. The actual reading on the Micrometer is the effective diameter.**

## NOTE ON THREAD MICROMETERS

Although Thread Micrometers are rapid and convenient in use, they have certain definite limitations.

They are only guaranteed accurate to fine limits when set to a standard thread plug gauge, and used for measuring threads having the same pitch and diameter as that gauge.

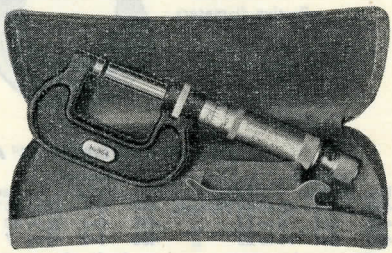
When not set to a plug gauge in this manner there is always a slight amount of inaccuracy depending on the Helix angle of the thread being measured.

The only method to ensure a Thread Micrometer giving correct readings is to have a separate Micrometer for every size of thread being measured. This, of course, is impracticable and therefore the small amount of error inherent in Thread Micrometers must be allowed for.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS

## WITH BLACK CRACKLE ENAMELLED FRAMES



No. **964** This is a Micrometer with a frame of girder section, which has been designed for use in awkward positions. It has a capacity of 0–1″ and is graduated to read in 1/1000's of an inch. Complete with ratchet and locknut.

No. **964A** As No. 964, but graduated to read in ½/1000's of an inch.

No. **964B** As No. 964, but graduated to read in 1/10,000's of an inch.

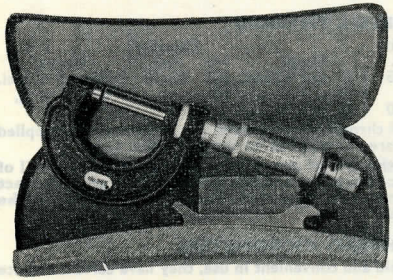
No. **964D** As No. 964, but without the ratchet.

No. **964E** As No. 964, but without the ratchet and the locknut.

No. **964M** As No. 964, but with a capacity of 0–25 mm., and graduated to read in 1/100's of a millimetre.

No. **964MD** As No. 964M, but without the ratchet.

No. **964ME** As No. 964M, but without the ratchet and the locknut.



No. **965** This is also a Micrometer with a frame of girder section. It has a capacity of 0–1″ and is graduated to read in 1/1000's of an inch. Complete with ratchet and locknut.

No. **965A** As No. 965, but graduated to read in ½/1000's of an inch.

No. **965B** As No. 965, but graduated to read in 1/10,000's of an inch.

No. **965D** As No. 965, but without the ratchet.

No. **965E** As No. 965, but without the ratchet and the locknut.

No. **965M** As No. 965, but with a capacity of 0–25 mm., and graduated to read in 1/100's of a millimetre.

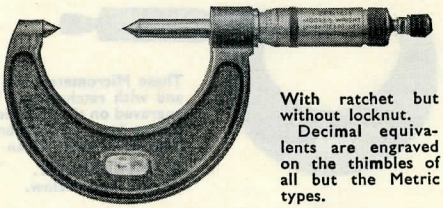
No. **965MD** As No. 965M, but without the ratchet.

No. **965ME** As No. 965M, but without the ratchet and the locknut.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH POINTED ANVIL AND SPINDLE

These Micrometers are similar to the No. **966** range, except that they have pointed anvils and spindles for the measuring of fluted articles. The points are not needle sharp, but are very slightly truncated. Supplied in wooden cases.

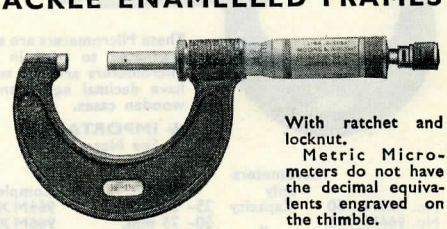


With ratchet but without locknut.
Decimal equivalents are engraved on the thimbles of all but the Metric types.

| | | | |
|---|---|---|---|
| No. **866/1″** | Capacity 0–1″ | Graduated to read in 1/1000's of an inch. | Black crackle enamelled frame |
| No. **866/2″** | ,, 1–2″ | ,, ,, ,, | |
| No. **866/3″** | ,, 2–3″ | ,, ,, ,, | |
| No. **866/4″** | ,, 3–4″ | ,, ,, ,, | ,, |
| No. **866/5″** | ,, 4–5″ | ,, ,, ,, | ,, |
| No. **866/6″** | ,, 5–6″ | ,, ,, ,, | ,, |
| No. **866M/25** | 0– 25 mm. | Graduated to read in 1/100's of a millimetre | ,, |
| No. **866M/50** | 25– 50 mm. | ,, ,, ,, ,, | ,, |
| No. **866M/75** | 50– 75 mm. | ,, ,, ,, ,, | ,, |
| No. **866M/100** | 75–100 mm. | ,, ,, ,, ,, | ,, |
| No. **866M/125** | 100–125 mm. | ,, ,, ,, ,, | ,, |
| No. **866M/150** | 125–150 mm. | ,, ,, ,, ,, | ,, |

# MICROMETERS
## WITH BLACK CRACKLE ENAMELLED FRAMES

These Micrometers are finished in black crackle enamel with decimal equivalents engraved on the thimbles. They are supplied complete with setting keys, in wooden cases.

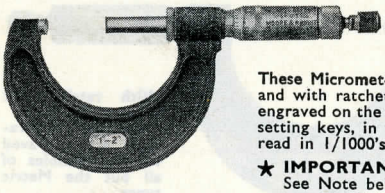


With ratchet and locknut.
Metric Micrometers do not have the decimal equivalents engraved on the thimble.

| | |
|---|---|
| No. **963/1½″** | Graduated to read in 1/1000's of an inch, with a capacity of ½″–1½″. Complete with ratchet and locknut. |
| No. **963B/1½″** | As above, but graduated to read in 1/10,000's of an inch. |
| No. **963D/1½″** | As No. 963/1½ but without the ratchet. |
| No. **963E/1½″** | ,, ,, ,, and the locknut. |
| No. **963M/38** | Graduated to read in 1/100's of a millimetre, with a capacity of 13–38 mm. Complete with ratchet and locknut. |
| No. **963MD/38** | As above but without the ratchet. |
| No. **963ME/38** | ,, ,, ,, and the locknut. |
| No. **963/2½″** | Graduated to read in 1/1000's of an inch, with a capacity of 1½–2½″. Complete with ratchet and locknut. |
| No. **963B/2½″** | As above but graduated to read in 1/10,000's of an inch. |
| No. **963D/2½″** | As No. 963/2½ but without the ratchet. |
| No. **963E/2½″** | ,, ,, ,, and the locknut. |
| No. **963M/63** | Graduated to read in 1/100's of a millimetre, with a capacity of 38–63 mm. |
| No. **963MD/63** | As above, but without the ratchet. |
| No. **963ME/63** | ,, ,, ,, and the locknut. |

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH BLACK CRACKLE ENAMELLED FRAMES



These Micrometers are finished in black crackle enamel, and with ratchets and locknuts. Decimal equivalents are engraved on the thimble. They are supplied complete with setting keys, in wooden cases. All sizes are graduated to read in 1/1000's of an inch.

★ **IMPORTANT.**
See Note below.

| Micrometers only | | Micrometers Complete with Radial End Setting Rods | |
|---|---|---|---|
| No. **966**/2″ | Capacity 1–2″ | **966X**/2″ | Capacity 1–2″ |
| No. **966**/3″ | ,, 2–3″ | **966X**/3″ | ,, 2–3″ |
| No. **966**/4″ | ,, 3–4″ | **966X**/4″ | ,, 3–4″ |
| No. **966**/5″ | ,, 4–5″ | **966X**/5″ | ,, 4–5″ |
| No. **966**/6″ | ,, 5–6″ | **966X**/6″ | ,, 5–6″ |

No. **966B** (sizes as above) Graduated to read in 1/10,000's of an inch—at an extra charge.
All the above Micrometers can be supplied in the following types at the same prices :—
No. **966D** (all sizes) As No. 966, but without the ratchet.
No. **966E** ( ,, ) ,, ,, ,, and the locknut.

These Micrometers are as the No. 966 Range, but they are graduated to read in 1/100's of a millimetre. Metric micrometers are not supplied with verniers and do not have decimal equivalents on the thimbles. Supplied in wooden cases.

★ **IMPORTANT.**
See Note below.

| Micrometers only | | | Micrometers Complete with Radial End Setting Rods | | |
|---|---|---|---|---|---|
| No. **966M**/ 50 | Capacity | 25– 50 mm. | **966MX**/ 50 | Capacity | 25– 50 mm. |
| No. **966M**/ 75 | ,, | 50– 75 mm. | **966MX**/ 75 | ,, | 50– 75 mm. |
| No. **966M**/100 | ,, | 75–100 mm. | **966MX**/100 | ,, | 75–100 mm. |
| No. **966M**/125 | ,, | 100–125 mm. | **966MX**/125 | ,, | 100–125 mm. |
| No. **966M**/150 | ,, | 125–150 mm. | **966MX**/150 | ,, | 125–150 mm. |

All the above Micrometers can be supplied in the following types at the same prices :—
No. **966MD** (all sizes) As No. 966M, but without the ratchet.
No. **966ME** ( ,, ) ,, ,, ,, and the locknut.

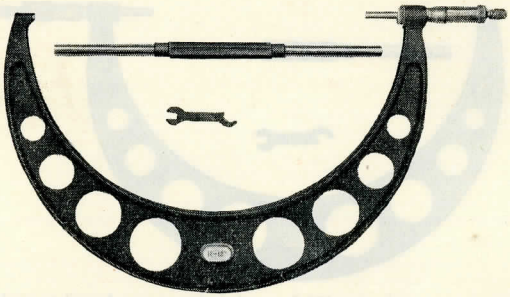
## ★SETTING RODS

When buying Micrometers with a range above 0–1″ or 0–25 mm. it is recommended that the requisite Micrometer Setting Rod be purchased with each instrument, so that the setting can be checked each time before use. Where these tools are issued to operatives from the works stores, **THE SETTING ROD SHOULD ALWAYS BE ISSUED WITH THE MICROMETER.**

All M. & W. Micrometer Setting Rods are fitted with rubber insulating grips and conform to the British Standards Institution Specification.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH BLACK CRACKLE ENAMELLED FRAMES



These Micrometers are finished in black crackle enamel, and are fitted with ratchets and locknuts and have decimal equivalents engraved on the thimble. They are supplied complete with setting keys in wooden cases. All sizes are graduated to read in 1/1000's of an inch.

| Micrometer only | | Micrometers Complete with Radial End Setting Rods | |
|---|---|---|---|
| No. **971**/ 7″ | Capacity 6″– 7″ | **971X**/ 7″ | Capacity 6″– 7″ |
| No. **971**/ 8″ | ,, 7″– 8″ | **971X**/ 8″ | ,, 7″– 8″ |
| No. **971**/ 9″ | ,, 8″– 9″ | **971X**/ 9″ | ,, 8″– 9″ |
| No. **971**/10″ | ,, 9″–10″ | **971X**/10″ | ,, 9″–10″ |
| No. **971**/11″ | ,, 10″–11″ | **971X**/11″ | ,, 10″–11″ |
| No. **971**/12″ | ,, 11″–12″ | **971X**/12″ | ,, 11″–12″ |

No. **971B** (sizes as above) Graduated to read in 1/10,000's of an inch at an extra charge. All sizes over 12″ are fitted with insulating pads to neutralise the heat of the hand.

| | | | |
|---|---|---|---|
| No. **971**/13″ | Capacity 12″–13″ | **971X**/13″ | Capacity 12″–13″ |
| No. **971**/14″ | ,, 13″–14″ | **971X**/14″ | ,, 13″–14″ |
| No. **971**/15″ | ,, 14″–15″ | **971X**/15″ | ,, 14″–15″ |
| No. **971**/16″ | ,, 15″–16″ | **971X**/16″ | ,, 15″–16″ |
| No. **971**/17″ | ,, 16″–17″ | **971X**/17″ | ,, 16″–17″ |
| No. **911**/18″ | ,, 17″–18″ | **971X**/18″ | ,, 17″–18″ |
| No. **971**/19″ | ,, 18″–19″ | **971X**/19″ | ,, 18″–19″ |
| No. **971**/20″ | ,, 19″–20″ | **971X**/20″ | ,, 19″–20″ |
| No. **971**/21″ | ,, 20″–21″ | **971X**/21″ | ,, 20″–21″ |
| No. **971**/22″ | ,, 21″–22″ | **971X**/22″ | ,, 21″–22″ |
| No. **971**/23″ | ,, 22″–23″ | **971X**/23″ | ,, 22″–23″ |
| No. **971**/24″ | ,, 23″–24″ | **971X**/24″ | ,, 23″–24″ |

All the above Micrometers can be supplied in the following types at the same prices :—

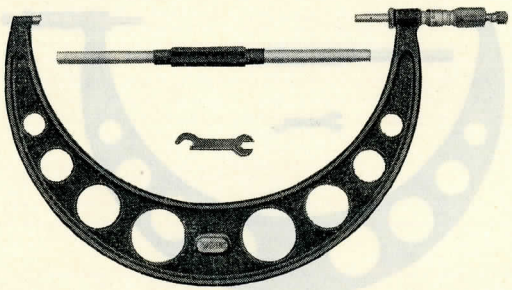
No. **971D** (all sizes) As No. 971 but without the ratchet.

No. **971E** (all sizes) As No. 971, but without the ratchet and the locknut.

**IMPORTANT.**—See note on page 22 about Setting Rods and large Micrometers.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS
## WITH BLACK CRACKLE ENAMELLED FRAMES



These Micrometers are as the No. **971** Range, but they are graduated to read in 1/100's of a millimetre.

| Micrometer only | | | Micrometers Complete with Radial End Setting Rods | | |
|---|---|---|---|---|---|
| No. **971M**/175 | Capacity | 150–175 mm. | **791MX**/175 | Capacity | 150–175 mm. |
| No. **971M**/200 | ,, | 175–200 mm. | **791MX**/200 | ,, | 175–200 mm. |
| No. **971M**/225 | ,, | 200–225 mm. | **791MX**/225 | ,, | 200–225 mm. |
| No. **971M**/250 | ,, | 225–250 mm. | **791MX**/250 | ,, | 225–250 mm. |
| No. **971M**/275 | ,, | 250–275 mm. | **791MX**/275 | ,, | 250–275 mm. |
| No. **971M**/300 | ,, | 275–300 mm. | **791MX**/300 | ,, | 275–300 mm. |

All sizes over 300 mm. are insulated against the heat of the hand.

| | | | | | |
|---|---|---|---|---|---|
| No. **971M**/325 | Capacity | 300–325 mm. | **971MX**/325 | Capacity | 300–325 mm. |
| No. **971M**/350 | ,, | 325–350 mm. | **971MX**/350 | ,, | 325–350 mm. |
| No. **971M**/375 | ,, | 350–375 mm. | **971MX**/375 | ,, | 350–375 mm. |
| No. **971M**/400 | ,, | 375–400 mm. | **971MX**/400 | ,, | 375–400 mm. |
| No. **971M**/425 | ,, | 400–425 mm. | **971MX**/425 | ,, | 400–425 mm. |
| No. **971M**/450 | ,, | 425–450 mm. | **971MX**/450 | ,, | 425–450 mm. |
| No. **971M**/475 | ,, | 450–475 mm. | **971MX**/475 | ,, | 450–475 mm. |
| No. **971M**/500 | ,, | 475–500 mm. | **971MX**/500 | ,, | 475–500 mm. |
| No. **971M**/525 | ,, | 500–525 mm. | **971MX**/525 | ,, | 500–525 mm. |
| No. **971M**/550 | ,, | 525–550 mm. | **971MX**/550 | ,, | 525–550 mm. |
| No. **971M**/575 | ,, | 550–575 mm. | **971MX**/575 | ,, | 550–575 mm. |
| No. **971M**/600 | ,, | 575–600 mm. | **971MX**/600 | ,, | 575–600 mm. |

All the above Micrometers can be supplied in the following types :—

No. **971MD** (all sizes) As No. 971M, but without the ratchet.

No. **971ME** ( ,, ) ,, ,, ,, and the locknut.

Metric Micrometers are not supplied with Verniers.

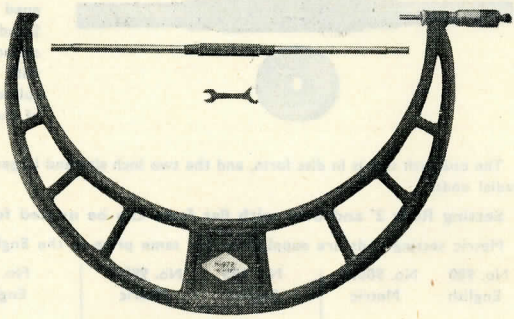
**Important.**—See note on page 22 about Setting Rods and large Micrometers.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS

## OF TUBULAR FRAME CONSTRUCTION

This is an entirely new departure in the manufacture of Micrometers, and it is the first time that this particular tubular frame construction has been used.



By reason of this method of manufacture the Micrometers have gained great rigidity with considerable saving in weight. These improvements plus the fact that the thimbles are $1\frac{3}{16}$" in diameter ensure easier and quicker reading with the accuracy you expect from M. & W. Micrometers.

They are finished in black crackle enamel, and are fitted with ratchets and locknuts. They are supplied with either English or Metric graduations, complete with setting keys in wooden cases.

| Micrometer only | | Micrometers Complete with Radial End Setting Rods | |
|---|---|---|---|
| No. **972**/16" | Capacity 15–16" | **972X**/16" | Capacity 15–16" |
| No. **972**/17" | ,, 16–17" | **972X**/17" | ,, 16–17" |
| No. **972**/18" | ,, 17–18" | **972X**/18" | ,, 17–18" |
| No. **972**/19" | ,, 18–19" | **972X**/19" | ,, 18–19" |
| No. **972**/20" | ,, 19–20" | **972X**/20" | ,, 19–20" |
| No. **972**/21" | ,, 20–21" | **972X**/21" | ,, 20–21" |
| No. **972**/22" | ,, 21–22" | **972X**/22" | ,, 21–22" |
| No. **972**/23" | ,, 22–23" | **972X**/23" | ,, 22–23" |
| No. **972**/24" | ,, 23–24" | **972X**/24" | ,, 23–24" |

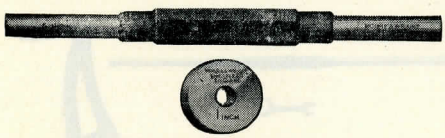
METRIC MICROMETERS as follows :—

| Micrometer only | | Micrometers Complete with Radial End Setting Rods | |
|---|---|---|---|
| No. **972M**/400 | Capacity 375–400 mm. | **972MX**/400 | Capacity 375–400 mm. |
| No. **972M**/425 | ,, 400–425 mm. | **972MX**/425 | ,, 400–425 mm. |
| No. **972M**/450 | ,, 425–450 mm. | **972MX**/450 | ,, 425–450 mm. |
| No. **972M**/475 | ,, 450–475 mm. | **972MX**/475 | ,, 450–475 mm. |
| No. **972M**/500 | ,, 475–500 mm. | **972MX**/500 | ,, 475–500 mm. |
| No. **972M**/525 | ,, 500–525 mm. | **972MX**/525 | ,, 500–525 mm. |
| No. **972M**/550 | ,, 525–550 mm. | **972MX**/550 | ,, 525–550 mm. |
| No. **972M**/575 | ,, 550–575 mm. | **972MX**/575 | ,, 550–575 mm. |
| No. **972M**/600 | ,, 575–600 mm. | **972MX**/600 | ,, 575–600 mm. |

No. **1100** One pair of Insulator Hand Grips for all the above micrometers.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETER SETTING RODS



These setting rods are hardened and lapped to British Standard Institution Specification 870 and they are fitted with rubber handles to insulate them against the heat of the hand during use.

The one inch size is in disc form, and the two inch size and larger are made as rods with radial ends.

**Setting Rods 2″ and over with flat faces can be quoted for on request.**

Metric setting rods are supplied at the same price as the English.

| No. **980** English | No. **980M** Metric | No. **980** English | No. **980M** Metric | No. **980** English | No. **980M** Metric |
|---|---|---|---|---|---|
| 1 in. Disc | 25 mm. Disc | 25 in. Rod | 625 mm. Rod | 49 in. Rod | 1225 mm. Rod. |
| 2 „ Rod | 50 mm. Rod | 26 „ „ | 650 „ | 50 „ „ | 1250 „ |
| 3 „ „ | 75 „ | 27 „ „ | 675 „ | 51 „ „ | 1275 „ |
| 4 „ „ | 100 „ | 28 „ „ | 700 „ | 52 „ „ | 1300 „ |
| 5 „ „ | 125 „ | 29 „ „ | 725 „ | 53 „ „ | 1325 „ |
| 6 „ „ | 150 „ | 30 „ „ | 750 „ | 54 „ „ | 1350 „ |
| 7 „ „ | 175 „ | 31 „ „ | 775 „ | 55 „ „ | 1375 „ |
| 8 „ „ | 200 „ | 32 „ „ | 800 „ | 56 „ „ | 1400 „ |
| 9 „ „ | 225 „ | 33 „ „ | 825 „ | 57 „ „ | 1425 „ |
| 10 „ „ | 250 „ | 34 „ „ | 850 „ | 58 „ „ | 1450 „ |
| 11 „ „ | 275 „ | 35 „ „ | 875 „ | 59 „ „ | 1475 „ |
| 12 „ „ | 300 „ | 36 „ „ | 900 „ | 60 „ „ | 1500 „ |
| 13 „ „ | 325 „ | 37 „ „ | 925 „ | 61 „ „ | 1525 „ |
| 14 „ „ | 350 „ | 38 „ „ | 950 „ | 62 „ „ | 1550 „ |
| 15 „ „ | 375 „ | 39 „ „ | 975 „ | 63 „ „ | 1575 „ |
| 16 „ „ | 400 „ | 40 „ „ | 1000 „ | 64 „ „ | 1600 „ |
| 17 „ „ | 425 „ | 41 „ „ | 1025 „ | 65 „ „ | 1625 „ |
| 18 „ „ | 450 „ | 42 „ „ | 1050 „ | 66 „ „ | 1650 „ |
| 19 „ „ | 475 „ | 43 „ „ | 1075 „ | 67 „ „ | 1675 „ |
| 20 „ „ | 500 „ | 44 „ „ | 1100 „ | 68 „ „ | 1700 „ |
| 21 „ „ | 525 „ | 45 „ „ | 1125 „ | 69 „ „ | 1725 „ |
| 22 „ „ | 550 „ | 46 „ „ | 1150 „ | 70 „ „ | 1750 „ |
| 23 „ „ | 575 „ | 47 „ „ | 1175 „ | 71 „ „ | 1775 „ |
| 24 „ „ | 600 „ | 48 „ „ | 1200 „ | | |

## SETTING RODS

When buying Micrometers with a range above 0–1″ or 0–25 mm., it is recommended that the requisite Micrometer Setting Rod be purchased with each instrument, so that the setting can be checked each time before use. Where these tools are issued to operatives from the works stores, **the Setting Rod should always be issued with the Micrometer.** All M. & W. Micrometer Setting Rods are fitted with rubber handles and conform to British Standard Institution Specification.

# MICROMETERS IN CASES

No. **1021** Consists of 1 Micrometer each, 961, 966/2″ and 966/3″, complete with Setting Rods and Keys, in wooden case.

No. **1021B** As No. 1021 but with Micrometers graduated to read in 1/10,000ths of an inch.

No. **1021M** As No. 1021 but with Micrometers graduated to read in 1/100ths of a millimetre.

No. **1025** Consists of 1 Micrometer each, 965, 966/2″ and 966/3″, complete with Setting Rods and Keys, as illustrated.

No. **1025B** As No. 1025 but with Micrometers graduated to read in 1/10,000ths of an inch.

No. **1025M** As No. 1025 but with Micrometers graduated to read in 1/100ths of a millimetre.

No. **1024** Case of 6 Micrometers, i.e. one each 961, 966/2″, 966/3″, 966/4″, 966/5″, 966/6″, covering a range from 0 to 6″, complete with Setting Rods and Keys, in wooden case, as illustrated.

No. **1024B,** as No. 1024 but with all Micrometers marked to read in 1/10,000ths of an inch.

No. **1024M** As No. 1024 but with Micrometers graduated to read in 1/100ths of a millimetre.

No. **1026** Case of 6 Micrometers, i.e. one each 971/7″, 971/8″, 971/9″, 971/10″, 971/11″, 971/12″, covering a range from 6″ to 12″, complete with Setting Rods and Keys, in wooden case.

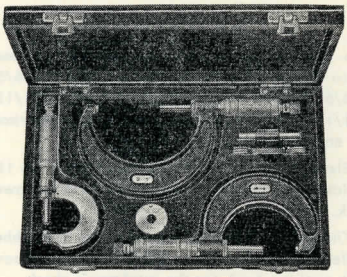
No. **1026B** As No. 1026 but with Micrometers graduated to read in 1/10,000ths of an inch.

No. **1026M** As No. 1026 but with Micrometers graduated to read in 1/100ths of a millimetre.

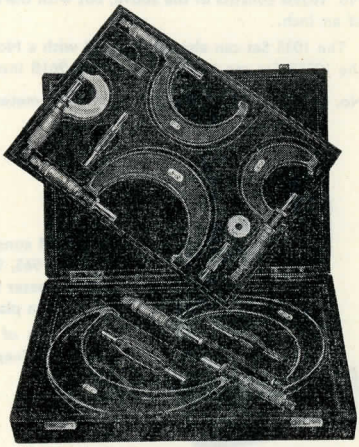
The Cases are strong, with an attractive appearance.

Any other assortment of micrometers can be supplied.

Quotations on request.



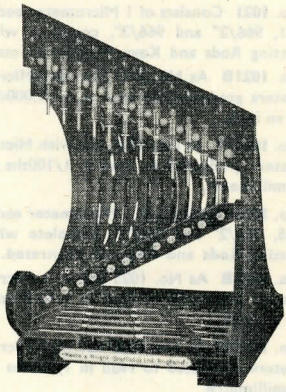
Cat. No. **1021**



Cat. No. **1024**

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# SETS OF MICROMETERS



No. **1035** consists of 12 Micrometers, viz.: one each 1″ to 12″, Nos. 965, 966/2″, 966/3″, 966/4″, 966/5″, 966/6″, 971/7″, 971/8″, 971/9″, 971/10″, 971/11″, 971/12″, and is an admirable set for the tool-room or engineers' shop.

Eleven micrometer setting rods from 1″ to 11″, inclusive, are provided and are housed in the lower rack.

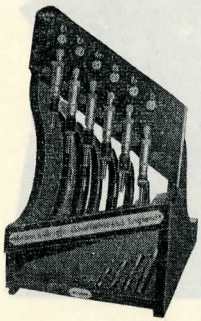
The rack itself is of solid hard wood, and rubber buffers are fitted between the instruments. Above each tool is a hook for the workman's check.

The size of the rack is approximately 25¼″ high, 16⅞″ wide, and 16½″ deep from back to front.

No. **1035B** consists of the above, but with the micrometers graduated to read in 1/10,000's of an inch.

The 1035 Set can also be supplied with a No. 961 Micrometer instead of a No. 965, and the 1035B Set can be supplied with a 961B instead of a 965B.

No. **1035M** as No. 1035, but with micrometers graduated to read in 1/100's mm.



No. **1034** consists of 6 micrometers, viz.: one each 1″ to 6″, Nos. 965, 966/2″, 966/3″, 966/4″, 966/5″, 966/6″, with 5 micrometer setting rods from 1″ to 5″. A No. 961 can be supplied in place of the No. 965.

The size of the rack is approximately 15¼″ high, 9½″ wide, 9½″ deep.

No. **1034B** consists of the above, but with the micrometers graduated to read in 1/10,000's of an inch. A No. 961B can be supplied in place of the No. 965B.

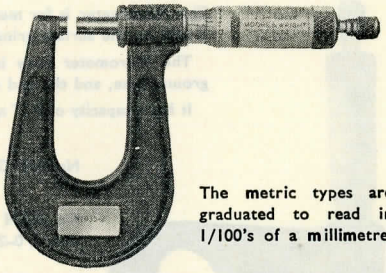
No. **1034M** as No. 1034, but with micrometers graduated to read in 1/100's mm.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# DEEP FRAME MICROMETERS
## WITH BLACK CRACKLE ENAMELLED FRAMES

These Micrometers are specially designed for gauging sheet metal, fibre, etc., a distance from the edge of the material. They will take up to 2", 4" or 6" inside the frames. Supplied with ratchets and locknuts and graduated to read in 1/1000's of an inch. Complete in wooden cases.

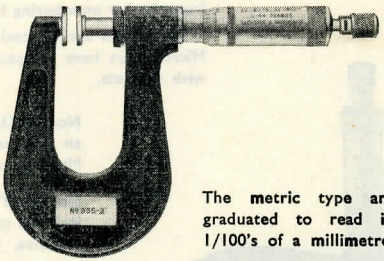
No. **935** can be supplied with a ball anvil.



The metric types are graduated to read in 1/100's of a millimetre.

No. **935/2** with frame 2" deep, capacity 0–½"
No. **935/4** „ 4" „ „ 0–1"
No. **935/6** „ 6" „ „ 0–1"
No. **935/2M** with frame 50 mm. deep, capacity 0–13 mm.
No. **935/4M** „ 100 mm. „ „ 0–25 mm.
No. **935/6M** „ 150 mm. „ „ 0–25 mm.

No. **936** is similar to No. 935, but is fitted with flanges on the anvil and the spindle for use on paper, linoleum and soft materials. They are graduated to read in 1/1000's of an inch. Complete in wooden cases.

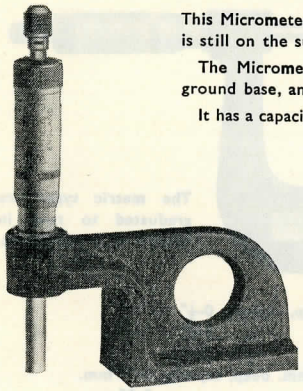


The metric type are graduated to read in 1/100's of a millimetre.

No. **936/2** with frame 2" deep, capacity 0–7/16" approximately
No. **936/4** „ 4" „ „ 0–⅞"
No. **936/6** „ 6" „ „ 0–⅞"
No. **936/2M** with frame 50 mm. deep, capacity 0–11 mm.
No. **936/4M** „ 100 mm. „ „ 0–22 mm.
No. **936/6M** „ 150 mm. „ „ 0–22 mm.
Larger capacities can be supplied on request.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# SURFACE GRINDER MICROMETER
## WITH BLACK CRACKLE ENAMELLED BODY



This Micrometer is for measuring the thickness of work while it is still on the surface grinder.

The Micrometer body is made of steel with a hardened and ground base, and the end of the spindle is radiused.

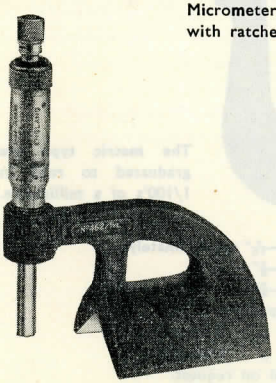
It has a capacity of 0–1″ and is supplied complete with ratchet.

No. **461** Graduated to read in 1/1000's of an inch.

No. **461M** Graduated to read in 1/100's of a millimetre, 0–25 mm. capacity.

Decimal equivalents are engraved on the thimble of Nos. **461** and **462,** but not on Nos. **461M** and **462M.**

# BORING BAR MICROMETERS



These Micrometers measure the actual distance the cutter projects from the bar on a boring bar machine.

The bodies are of steel and are hardened and ground. These Micrometers have a capacity of 0–1″ and are supplied complete with ratchets.

No. **462/1½″** Graduated to read in 1/1000's of an inch, and to take bars up to 1½″ in diameter. Made to order only.

No. **462/3″** Graduated to read in 1/1000's of an inch and to take bars from 1¾″ to 3″ in diameter, inclusive. Made to order only.

No. **462M/38 mm.** Graduated to read in 1/100's of a millimetre, 0–25 mm. capacity, and to take bars up to 38 mm. in diameter. Made to order only

No **462M/75 mm.** Graduated to read in 1/100's of a millimetre, 0–25 mm. capacity, and to take bars from 44 to 75 mm. in diameter, inclusive. Made to order only.

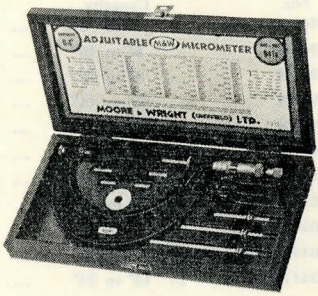
**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# ADJUSTABLE MICROMETERS

These Micrometers have a range of measurement from two to six times greater than the ordinary Micrometer with fixed anvil. This large range is obtained by the use of separate anvils which are accurately fitted to the frame and are readily interchangeable. All sizes up to 6 inches have drop forged steel frames, while larger sizes have frames of carefully-chosen malleable iron. They are finished in black crackle enamel, with ratchets and locknuts.
The English range are graduated to read in 1/1000's of an inch, and the Metric range are graduated to read in 1/100's of a millimetre.

| No. | Capacity | Number of Micrometer Setting Rods | Number of Interchangeable Anvils |
|---|---|---|---|
| **940X** | 0 to 2" | 1 | 2 |
| **941X** | 0 to 4" | 3 | 4 |
| **942X** | 2 to 6" | 4 | 4 |
| **940MX** | 0– 50 mm. | 1 | 2 |
| **941MX** | 0–100 mm. | 3 | 4 |
| **942MX** | 50–150 mm. | 4 | 4 |

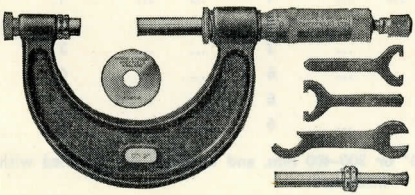
These Micrometers are not supplied with sleeves engraved with vernier readings in 1/10,000's of an inch.
Each set is sent complete with setting rods and keys in a strong, fitted wooden case. The inside fitments are so designed to carry each interchangeable part separately. This lessens the risk of damage, and loss during transit and subsequent use.




**Instructions for Adjustment**

Adjustment for looseness in the screw and for error in zero-setting are as described on page 5. Use the large key. Wear on the anvils can be adjusted by means of the two adjusting nuts. The two small keys are supplied for this purpose.

When adjusting use the ratchet and the setting rods provided and take care not to adjust an anvil when it is really the zero-setting which is faulty, otherwise the remaining anvils will still be incorrect, and vice versa, do not use the zero-setting to correct wear on an anvil.



The adjustable micrometer illustrated is a No. **940X** graduated to read in 1/1000's of an inch.

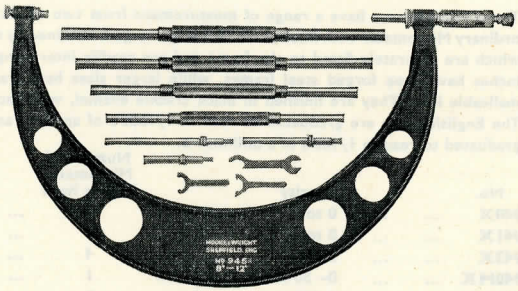
Decimal equivalents are engraved on thimbles of all but the metric micrometers.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# ADJUSTABLE MICROMETERS

All these Micrometers have a black crackle enamelled finish, and decimal equivalents are engraved on all but the Metric Micrometers.

Supplied in wooden cases with setting keys.



| No. | Capacity | Number of Micrometer Setting Rods | Number of Interchangeable Anvils |
|---|---|---|---|
| **943X** | 4″ to 8″ | 4 | 4 |
| **944X** | 6″ to 10″ | 4 | 4 |
| **945X** | 8″ to 12″ | 4 | 4 |
| **948X** | 12″ to 16″ | 4 | 4 |
| **949X** | 16″ to 20″ | 4 | 4 |
| **951X** | 20″ to 24″ | 4 | 4 |
| **1036X** | 6″ to 9″ | 3 | 3 |
| **1037X** | 9″ to 12″ | 3 | 3 |
| **1044X/12″** | 6″ to 12″ | 6 | 6 |
| **1044X/18″** | 12″ to 18″ | 6 | 6 |
| **1044X/24″** | 18″ to 24″ | 6 | 6 |
| **943MX** | 100 to 200 mm. | 4 | 4 |
| **944MX** | 150 to 250 mm | 4 | 4 |
| **945MX** | 200 to 300 mm. | 4 | 4 |
| **948MX** | 300 to 400 mm. | 4 | 4 |
| **949MX** | 400 to 500 mm. | 4 | 4 |
| **951MX** | 500 to 600 mm. | 4 | 4 |
| **1036MX** | 150 to 225 mm. | 3 | 3 |
| **1037MX** | 225 to 300 mm. | 3 | 3 |
| **1044X/30 mm.** | 150 to 300 mm. | 6 | 6 |
| **1044X/45 mm.** | 300 to 450 mm. | 6 | 6 |
| **1044X/600 mm.** | 450 to 600 mm. | 6 | 6 |

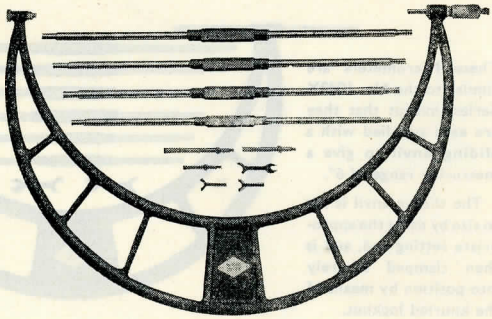
All micrometers of capacities 12″–16″ or 300–400 mm. and upwards, are supplied with Insulators

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# ADJUSTABLE MICROMETERS
## OF TUBULAR FRAME CONSTRUCTION

This is an entirely new departure in the manufacture of Micrometers, and it is the first time that this particular tubular frame construction has been used.

By reason of this method of manufacture the Micrometers have gained great rigidity with a considerable saving in weight. These improvements plus the fact that the thimbles are $\frac{3}{16}$" in diameter ensure easier and quicker reading with the accuracy you expect from M. & W. Micrometers.



They are finished in black crackle enamel, and are fitted with ratchets and locknuts.

They are complete with either English or Metric graduations and with setting keys in polished hinged-lid wooden cases.

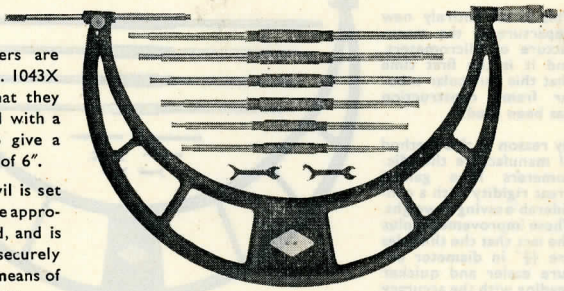
| No. | Capacity | Number of Micrometer Setting Rods | Number of Interchangeable Anvils |
|---|---|---|---|
| **1040X** | 12 to 16" | 4 | 4 |
| **1041X** | 16 to 20" | 4 | 4 |
| **1042X** | 20 to 24" | 4 | 4 |
| **1043X/18"** | 12 to 18" | 6 | 6 |
| **1043X/24"** | 18 to 24" | 6 | 6 |
| **1043X/30"** | 24 to 30" | 6 | 6 |
| **1043X/36"** | 30 to 36" | 6 | 6 |
| **1043X/42"** | 36 to 42" | 6 | 6 |
| **1043X/48"** | 42 to 48" | 6 | 6 |
| **1043X/54"** | 48 to 54" | 6 | 6 |
| **1043X/60"** | 54 to 60" | 6 | 6 |
| **1043X/66"** | 60 to 66" | 6 | 6 |
| **1043X/72"** | 66 to 72" | 6 | 6 |

Metric Micrometers are as follows :—

| | | | |
|---|---|---|---|
| **1040MX** | 300 to 400 mm. | 4 | 4 |
| **1041MX** | 400 to 500 mm. | 4 | 4 |
| **1042MX** | 500 to 600 mm | 4 | 4 |
| **1043MX/450 mm.** | 300 to 450 mm. | 6 | 6 |
| **1043MX/600 mm.** | 450 to 600 mm. | 6 | 6 |
| **1043MX/750 mm.** | 600 to 750 mm. | 6 | 6 |
| **1043MX/900 mm.** | 750 to 900 mm. | 6 | 6 |
| **1043MX/1050 mm.** | 900 to 1050 mm. | 6 | 6 |
| **1043MX/1200 mm.** | 1050 to 1200 mm. | 6 | 6 |
| **1043MX/1350 mm.** | 1200 to 1350 mm. | 6 | 6 |
| **1043MX/1500 mm.** | 1350 to 1500 mm. | 6 | 6 |
| **1043MX/1650 mm.** | 1500 to 1650 mm. | 6 | 6 |
| **1043MX/1800 mm.** | 1650 to 1800 mm. | 6 | 6 |
| **1100** | One pair of Insulator Hand Grips for the above micrometers. | | |

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# ADJUSTABLE MICROMETERS WITH SLIDING ANVILS



These Micrometers are similar to the No. 1043X Series, except that they are each supplied with a **sliding anvil** to give a measuring range of 6″.

The sliding anvil is set to size by using the appropriate setting rod, and is then clamped securely into position by means of the knurled locknut.

All these Micrometers have a black crackle enamelled finish, and decimal equivalents are engraved on all but the Metric Micrometers. They are each supplied complete with a setting key in a wooden case.

| No. | Capacity |
|---|---|
| **1039X**/18″ ... ... ... | 12″–18″ |
| **1039X**/24″ ... ... ... | 18″–24″ |
| **1039X**/30″ ... ... ... | 24″–30″ |
| **1039X**/36″ ... ... ... | 30″–36″ |
| **1039X**/42″ ... ... ... | 36″–42″ |
| **1039X**/48″ ... ... ... | 42″–48″ |
| **1039X**/54″ ... ... ... | 48″–54″ |
| **1039X**/60″ ... ... ... | 54″–60″ |
| **1039X**/66″ ... ... ... | 60″–66″ |
| **1039X**/72″ ... ... ... | 66″–72″ |

| No. | Capacity |
|---|---|
| **1039MX**/ 450 mm. ... | 300– 450 mm. |
| **1039MX**/ 600 mm. ... | 450– 600 mm. |
| **1039MX**/ 750 mm. ... | 600– 750 mm. |
| **1039MX**/ 900 mm. ... | 750– 900 mm. |
| **1039MX**/1050 mm. ... | 900–1050 mm. |
| **1039MX**/1200 mm. ... | 1050–1200 mm. |
| **1039MX**/1350 mm. ... | 1200–1350 mm. |
| **1039MX**/1500 mm. ... | 1350–1500 mm. |
| **1039MX**/1650 mm. ... | 1500–1650 mm. |
| **1039MX**/1800 mm. ... | 1650–1800 mm. |

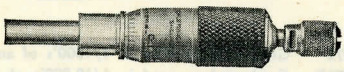
**1100** One pair of Insulated Hand Grips for the above Micrometers.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETER HEADS
## FOR USE IN JIGS AND FIXTURES, ETC.

Micrometer Heads are specially made for use in jigs, fixtures and precision measuring instruments, etc.

The 0–½″ capacity Micrometer heads are supplied with ratchets but without locknuts.



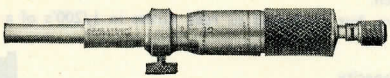
No. **897**

No. **897** 0–½″ capacity. Graduated to read in 1/1000's of an inch.
No. **897B** As No. 897, but graduated to read in 1/10,000's of an inch.
No. **897M** As No. 897, 0–13 mm. capacity. Graduated to read in 1/100's of a millimetre.
No. **898** As No. 897, but with depth gauge graduations.
No. **898M** As No. 897M, but with depth gauge graduations.

No. **952**

The 0–1″ capacity Micrometer heads are supplied with or without ratchets and locknuts, or lockscrews.

No. **952** Graduated to read in 1/1000's of an inch, as illustrated.
No. **952B** ,, ,, 1/10,000's ,,
No. **952E** As No. 952, but without ratchet and locknut.
No. **952M** As No. 952, 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.
No. **952O** As No. 952, but without locknut.
No. **953** As No. 952, but with depth gauge readings.
No. **953E** As No. 952E, ,, ,, ,,
No. **953M** As No. 952M, ,, ,, ,,
No. **953O** As No. 953, but without locknut.



No. **954**

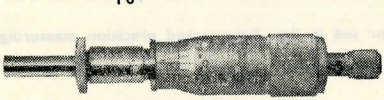
No. **954** Graduated to read in 1/1000's of an inch, as illustrated.
No. **954B** ,, ,, 1/10,000's ,,
No. **954E** As No. 954, but without ratchet and lockscrew.
No. **954M** As No. 954, 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.
No. **955** As No. 954, but with depth gauge readings.
No. **955E** As No. 954E, ,, ,, ,,
No. **955M** As No. 954M, ,, ,, ,,

All Micrometer Heads shown in our Catalogue are to British Standard Specification.

**SEE PAGE 38 FOR GENERAL SIZES**

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETER HEADS
## WITH $\frac{13}{16}$" DIAMETER THIMBLES



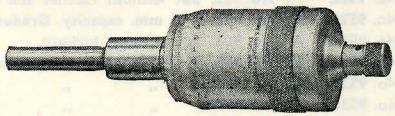
These heads are similar to Nos. 952 and 953, on page 35, with the exception of the larger diameter thimble and sleeve.

No.
**472** Graduated to read in 1/1000's of an inch.
**472B** Graduated to read in 1/10,000's of an inch.
**472M** As No. 472, 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.
**472O** As No. 472, but without locknut.
**473** As No. 472, but with depth gauge readings.
**473M** As No. 472M, but with depth gauge readings.
**473O** As No. 473, but without locknut.
Metric Micrometer Heads are not supplied with Vernier graduations.

# LARGE MICROMETER HEADS
## FOR BENCH MICROMETER AND PRECISION INSTRUMENT WORK

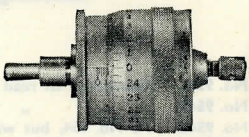
These heads are made to be incorporated in Bench Micrometers, Precision Instruments or Machines where accurate direct reading is desired.

No. **477** 0–1" Capacity.
No. **477M** 0–25 mm. Capacity.
Supplied fitted with dummy speeder, but can be fitted with ratchet at extra cost.



No. **477** This head has a $1\frac{1}{8}$" diameter thimble and is graduated to read direct in 2/10,000's of an inch.
No. **477M** As above, but graduated to read direct in 1/200's of a millimetre.

No. **475** 0–$\frac{1}{2}$" Capacity
No. **475M** 0–13 mm. Capacity.
Supplied fitted with dummy speeder, but can be fitted with ratchet at extra cost.



No. **475** Graduated to read direct in 1/10,000's of an inch. Fitted with a $1\frac{1}{2}$" diameter thimble.
No. **475M** As above but graduated to read in 1/500's of a millimetre.
All Micrometer Heads shown in our Catalogue are to British Standard Specification.

**SEE PAGE 38 FOR GENERAL SIZES**

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

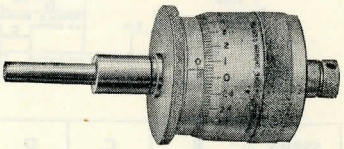
# LARGE MICROMETER HEADS

## FOR BENCH MICROMETER AND PRECISION INSTRUMENT WORK

No. **479** 0–1″ Capacity.

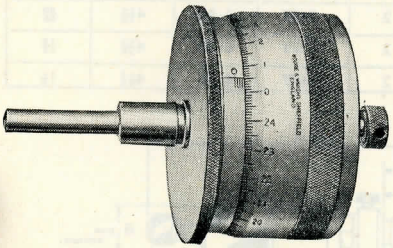
No. **479M** 0–25 mm. Capacity.

Supplied fitted with dummy speeder, but can be fitted with ratchet at extra cost.



No. **479** Graduated to read direct in 2/10,000's of an inch, but with a $1\frac{5}{8}$″ diameter thimble.

No. **479M** As above, but graduated to read direct in 1/200's of a millimetre.



This Micrometer Head is supplied fitted with dummy speeder, but can be fitted with ratchet at extra cost.

Each Micrometer Head is packed in a strong fitted wooden case.

No. **480** 0–1″ Capacity.

No. **480M** 0–25 mm. Capacity.

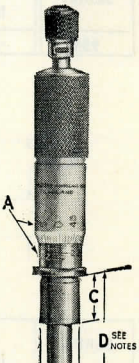
No. **480** This Head has a $2\frac{5}{8}$″ diameter thimble, and is graduated to read direct in 1/10,000's of an inch.

No. **480M** As above, but graduated to read direct in 1/500's of a millimetre.

# BORING BAR MICROMETER HEADS

## DOUBLE READING

These heads can be supplied in the following graduations: 0·0—2·0; 1·0—3·0; 1·25—3·25; 1·5—3·5; 1·8—3·8; 1·9—3·9; 2·0—4·0; 2·2—4·2; and as we make them for all types of Boring-Bar Machines we shall be pleased to quote on receipt of full specification or drawing for other sizes and/or graduations with a maximum capacity of 2″ double reading.




The following must be given :—

**A.**—Details of Graduations on Sleeve and Thimble.

**B.**—Diameter of Stem.

**C.**—Length of Stem from under collar.

**D.**—Length of Projection of Spindle from under collar.

These should be given when the Micrometer is screwed right down, e.g. in the example illustrated it would be given when the Micrometer was reading 2·2 in.

NOTE.—Normal MAXIMUM sizes for B, C and D are $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 2 in. respectively.

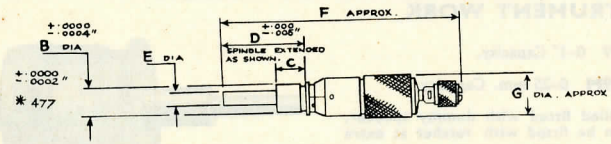
No. **465** These micrometer heads are made direct reading, i.e. to give the actual diameter of the bore.

All Micrometer Heads shown in our Catalogue are to British Standard Specification.

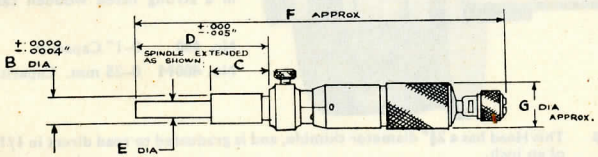
**SEE PAGE 138 FOR GENERAL SIZES**

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

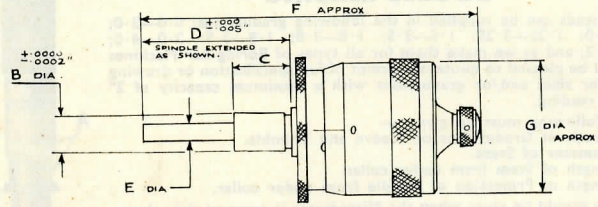
# MICROMETER HEADS · GENERAL SIZES




| SERIES | B inch | C inch | D inch | E inch | E mm. | F inch | G inch |
|---|---|---|---|---|---|---|---|
| 897 | ·375 | $\frac{3}{8}$ | 1 | ·2067 | 5·25 | $3\frac{3}{16}$ | $\frac{35}{64}$ |
| 952 | ·500 | $\frac{3}{4}$ | 2 | ·2677 | 6·80 | $4\frac{13}{16}$ | $\frac{39}{64}$ |
| 472 | ·500 | $\frac{3}{4}$ | 2 | ·2677 | 6·80 | $4\frac{13}{16}$ | $1\frac{3}{16}$ |
| 477 | ·500* | $\frac{3}{4}$ | 2 | ·2677 | 6·80 | $4\frac{17}{32}$ | $1\frac{1}{8}$ |



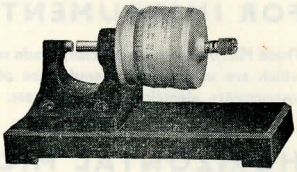

| SERIES | B inch | C inch | D inch | E inch | E mm. | F inch | G inch |
|---|---|---|---|---|---|---|---|
| 954 | ·375 | $\frac{3}{4}$ | $1\frac{51}{64}$ | ·2677 | 6·80 | $4\frac{13}{16}$ | $\frac{39}{64}$ |




| SERIES | B inch | C inch | D inch | E inch | E mm. | F inch | G inch |
|---|---|---|---|---|---|---|---|
| 475 | ·375 | $\frac{3}{8}$ | $1\frac{5}{16}$ | ·2067 | 5·25 | $2\frac{7}{8}$ | $1\frac{1}{2}$ |
| 479 | ·500 | $\frac{3}{4}$ | 2 | ·2667 | 6·80 | $4\frac{7}{16}$ | $1\frac{5}{8}$ |
| 480 | ·500 | $\frac{3}{4}$ | 2 | ·2667 | 6·80 | $4\frac{7}{16}$ | $2\frac{3}{8}$ |

THESE SIZES ALSO APPLY TO MICROMETER HEADS WITH DEPTH GAUGE OR METRIC GRADUATIONS.

# BENCH MICROMETERS

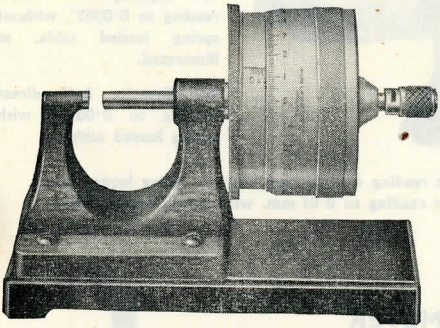


All fine bench work will find a use for these Micrometers. Each one is comprised of a Pearl chrome plated Micrometer Head and a black crackle enamelled frame fitted to a hardwood stand.

Supplied complete with ratchet and setting key.

No. **474** With a $1\frac{1}{2}$″ diameter thimble and a capacity of 0–$\frac{1}{2}$″. Graduated to read direct in 1/10,000's of an inch.

No. **474M** As No. 474, 0–13 mm. capacity. Graduated to read direct in 1/500's of a millimetre.



No. **476** This Micrometer has a capacity of 0–1″, with a $2\frac{3}{8}$″ diameter thimble, and is graduated to read direct in 1/10,000's of an inch.

No. **476M** As No. 476, 0–25 mm. capacity. Graduated to read direct in 1/500's of a millimetre.

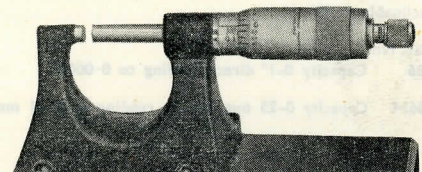
No. **476/2** This Micrometer has a capacity of 1–2″, with a $2\frac{3}{8}$″ diameter thimble, and is graduated to read direct in 1/10,000's of an inch.

No. **476M/2** As No. 476/2, 25–50 mm. capacity. Graduated to read direct in 1/500's of a millimetre.

No. **478** With a capacity of 0–1″ and a $1\frac{3}{16}$″ diameter thimble, this Micrometer is graduated to read in 1/1000's of an inch.

No. **478M** As No. 478, 0–25 mm. capacity. Graduated to read in 1/100's of a millimetre.

No. **478/2** With a capacity of 1–2″ and a $1\frac{3}{16}$″ diameter thimble, this Micrometer is graduated to read in 1/1000's of an inch.



No. **478M/2** As No. 478/2, 25–50 mm. capacity. Graduated to read in 1/100's of a millimetre

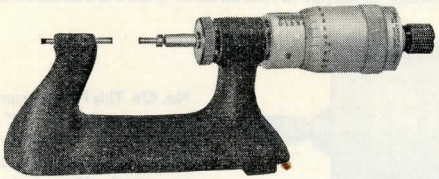
The Bench Micrometers on this page are supplied in wooden cases.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# BENCH MICROMETERS
## FOR INSTRUMENT MAKERS

These Micrometers are specially made to accurately measure small and intricate components which are used in the manufacture of watches, clocks, meters, scientific and measuring instruments, electrical equipment, etc.

## HORIZONTAL MICROMETER WITH NON-ROTATING SPINDLE



Cat. No.
**484** Capacity 0–1″ direct reading to 0·0002″, without spring loaded table, as illustrated.

**485** Capacity 0–1″ direct reading to 0·0002″, with spring loaded table.

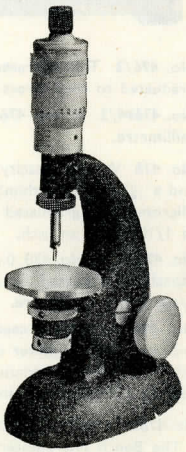
**484M** Capacity 0–25 mm. direct reading to 0·01 mm. without spring loaded table.
**485M** Capacity 0–25 mm. direct reading to 0·01 mm. with spring loaded table.

## VERTICAL MICROMETER WITH NON-ROTATING SPINDLE

This Bench Micrometer is supplied with a plain table which is 50 mm. in diameter. The body of this micrometer is also inclinable to 50°.

Cat. No.
**486** Capacity 0–1″ direct reading to 0·0002″.

**486M** Capacity 0–25 mm. direct reading to 0·01 mm.



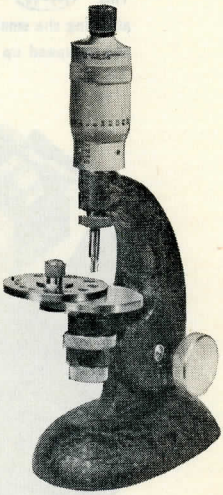
The Bench Micrometers on this page are normally supplied in wooden carrying boxes.

Fitted cases can be supplied at an extra cost.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# BENCH MICROMETER
## FOR INSTRUMENT MAKERS

## VERTICAL MICROMETER



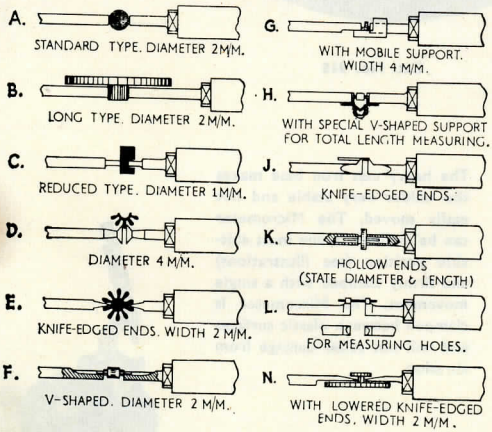
This Bench Micrometer is supplied with a Revolving Table which is 50 mm. in diameter, with 25 holes from 0·2 to 5·0 mm. diameter. The body of this micrometer is also inclinable to 50°.

Cat. No.
**487** Capacity 0–1″ direct reading to 0·0002″.
**487M** Capacity 0–25 mm. direct reading to 0·01 mm.

Normally supplied in a wooden carrying box.

A fitted case can be supplield at an extra cost.

## ANVIL AND SPINDLE TIPS




The anvil and spindle tips available are illustrated opposite.

When ordering a Micrometer state type of anvil and spindle tips required.

The tips are easily removed and are interchangeable.

Standard "A" type tips will be supplied unless otherwise stated.

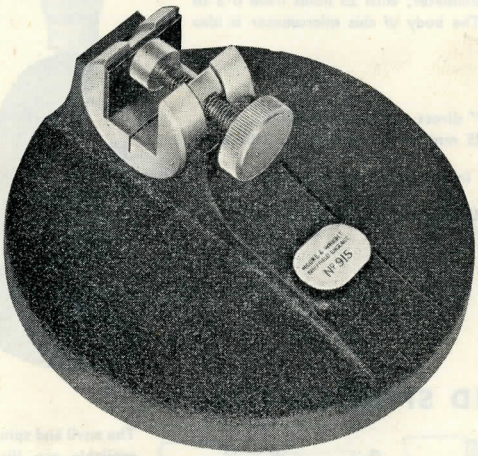
N.B. — Vertical Micrometers having no anvil require spindle tips only.

Special shaped tips not shown opposite could be made on request.

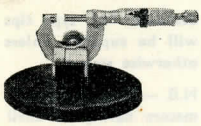
**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETER HOLDER

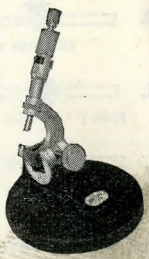
This (M&W) product has been designed primarily for adapting the smaller types of hand Micrometers for Bench use and to speed up production on quantity inspection.




Cat. No. **915**



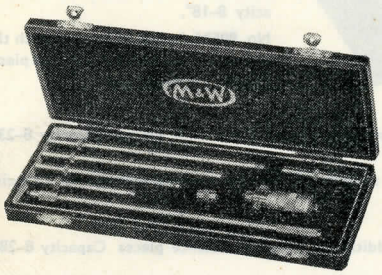
The heavy cast iron base makes the holder very stable and not easily moved. The Micrometer can be inclined to the most suitable position (see illustrations) and firmly clamped with a single movement. The Micrometer is clamped between plastic surfaces and will not suffer damage from abrasion.



# INSIDE MICROMETERS

No. **901** with a capacity of 1"–2", is graduated to read in 1/1000's of an inch, and consists of :—
1 Micrometer body with 0·25" movement of the screw.
2 Extension Rods.
1 Distance Piece, 0·25" long.
1 Adjusting Key.
1 Extension Handle.

No. **901M** with a capacity of 25 mm.–55 mm., is graduated to read in 1/100's of a millimetre, and consists of :
1 Micrometer body with 5 mm. movement of the screw.
3 Extension Rods.
1 Distant Piece, 5 mm. long.
1 Adjusting Key.
1 Extension Handle.

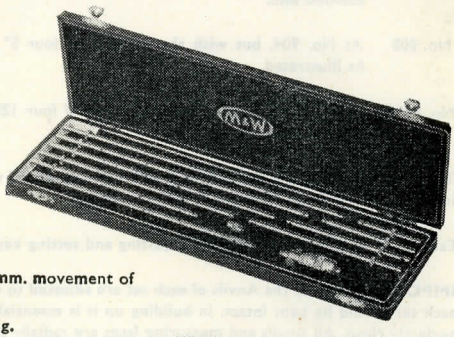


No. **902** with a capacity of 2"–8", is graduated to read in 1/1000's of an inch and consists of :—
1 Micrometer body with 0·5" movement of the screw.
6 Extension Rods.
1 Distance Piece, 0·5" long.
1 Adjusting Key.
1 Extension Handle.

No. **902M**, with a capacity of 50 mm.–210 mm., is graduated to read in 1/100's of a millimetre and consists of :—
1 Micrometer body with 10 mm. movement of the screw.
8 Extension Rods.
1 Distance Piece, 10 mm. long.
1 Adjusting Key.
1 Extension Handle.

No. **903** with a capacity of 2"–12" is graduated to read in 1/1000's of an inch, and consists of :—
1 Micrometer body with 0·5" movement of the screw.
10 Extension Rods.
1 Distance Piece, 0·5" long.
1 Adjusting Key.
1 Extension Handle.

No. **903M**, with a capacity of 50 mm.–310 mm., is graduated to read in 1/100's of a millimetre, and consists of:—
1 Micrometer body with 10 mm. movement of the screw.
13 Extension Rods.
1 Distance Piece, 10 mm. long.
1 Adjusting Key.
1 Extension Handle.



*All above are supplied in Velvet Lined Instrument Cases*

**Important.**—See the note regarding Anvils on page 44.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# INSIDE MICROMETERS

No. 908

The larger Inside Micrometer Sets are made up as specified below :—

No. **904** 1 Micrometer body with a 1″ movement of the screw, graduated to read in 1/1000's of an inch; 5 adjustable anvils and 4 adjusting keys. Capacity 8–13″.

No. **904M** As No. 904, but with a 25 mm. movement of the screw; graduated to read in 1/100's of a millimetre. Capacity 200–325 mm.

No. **905** As No. 904, but with the addition of one 5″ distance piece. Capacity 8–18″.

No. **905M** As No. 904M, but with the addition of one 152 mm. distance piece. Capacity 200–450 mm.

No. **906** As No. 904, but with the addition of two 5″ distance pieces. Capacity 8–23″.

No. **906M** As No. 904M, but with the addition of two 125 mm. distance pieces. Capacity 200–575 mm.

No. **907** As No. 904, but with the addition of three 5″ distance pieces Capacity 8–28″.

No. **907M** As No. 904M, but with the addition of three 125 mm. distant pieces. Capacity 200–700 mm.

No. **908** As No. 904, but with the addition of four 5″ distance pieces. Capacity 8–33″ As illustrated.

No. **908M** As No. 904M, but with the addition of four 125 mm. distance pieces. Capacity 200–825 mm.

The capacities of the No. 908 and No. 908M can be extended to 48″ and 1200 mm. respectively in increments of 5″ or 125 mm. Prices on request.

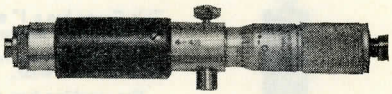
Each set is supplied complete with adjusting and setting keys in a wooden case.

**IMPORTANT.**—As the Anvils of each set are adjusted to suit each particular Micrometer, each set should be kept intact. In building up it is essential that all joining faces should be perfectly clean. All Anvils and measuring faces are radially ground after hardening.

When assembling any of the rods or distance pieces with the micrometer body, the zero marks (0—→) should be in line.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# TUBULAR INSIDE MICROMETERS



These Inside Micrometers are easy to use, due to the fact that they are made of a strong but light tubing, and as the measuring Anvils are ground to a radius they can be used on either flat or curved surfaces.

Each Micrometer, except the two smaller sizes (2"–2½" and 2½"–3") is fitted with a fibre insulation to prevent expansion due to hand heat.

No. **783** is graduated to read in 1/1000's of an inch, and the No. 783M is graduated to read in 1/100's of a millimetre.

| No. **783** | | No. **783M** | |
|---|---|---|---|
| Range, Inches | Range, Inches | Range, Millimetres | Range, Millimetres |
| *2 to 2½ | 6 to 7 | *50 to 63 | 150 to 175 |
| 2½ to 3 | 7 to 8 | 63 to 75 | 175 to 200 |
| 3 to 3½ | 8 to 9 | 75 to 88 | 200 to 225 |
| 3½ to 4 | 9 to 10 | 88 to 100 | 225 to 250 |
| 4 to 4½ | 10 to 11 | 100 to 113 | 250 to 275 |
| 4½ to 5 | 11 to 12 | 113 to 125 | 275 to 300 |
| 5 to 6 | | 125 to 150 | |

*This size has no clamp screw.

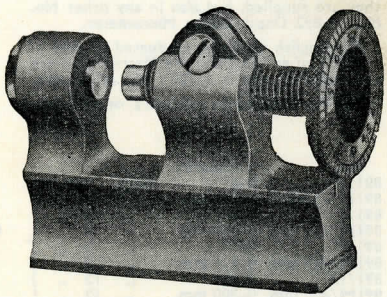
This range can be supplied in larger sizes up to 71"–72" and 1775 mm.–1800 mm. Prices on request.

No. **784**—Set of 7 Micrometers measuring 2" to 6", in wooden case.

No. **785**—Set of 13 Micrometers measuring 2" to 12", in wooden case.

No. **786** Handle for using with small sizes from 2" to 5".

# ROLLING MILL MICROMETERS



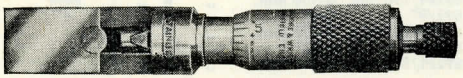
These Micrometers are provided with ample adjustment and are robustly made for use in rolling mills. They are made with brass bodies and the dials are easily read. They will stand very hard wear.

No. **178** Capacity 0–½", with a 2½" base and graduated to read in 1/1000's of an inch.

No. **179** As No. 178, but with a 3" base.

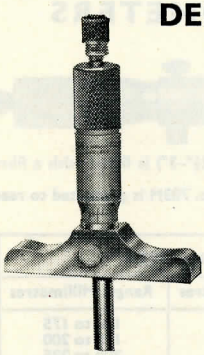
# SEAM MICROMETER

No. **1152** For measuring seams of Metal Boxes, Containers, etc.



**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# DEPTH GAUGE MICROMETERS



This Gauge has a 1" movement of the screw and will be found very useful for measuring the depths of grooves and holes, etc.

It is fitted with a hardened and thread ground screw, and is adjustable for wear.

The working face of the base is hardened and ground, the Spindle has a lapped finish and the Gauge is fitted with a Spindle locking screw.

The diameter of the rod is ·2677" or 6·8 mm.

No. **890**—Graduated to read in 1/1000's of an inch.

No. **890M**—Graduated to read in 1/100's of a mm.

# ADJUSTABLE DEPTH GAUGE MICROMETERS

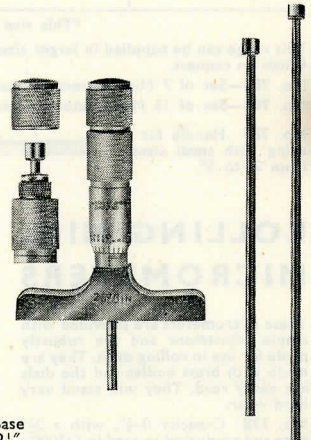
On this type of Gauge the micrometer head has a one inch movement, and readings of various depths up to 12" or 300 mm. can be obtained by the use of the interchangeable rods, which are easily inserted in the head, as illustrated.

The rods and base are hardened on the measuring faces.

The base of these Depth Gauge Micrometers has been redesigned, and the rods are not only interchangeable in the micrometer with which they are supplied, but also in any other No. 891 or 892 Depth Gauge Micrometer.

The English types are graduated to read in 1/1000's of an inch, and the Metric types are graduated to read in 1/100's of a millimetre.

The diameters of the rods are $\frac{1}{8}$" or 3·17 mm.

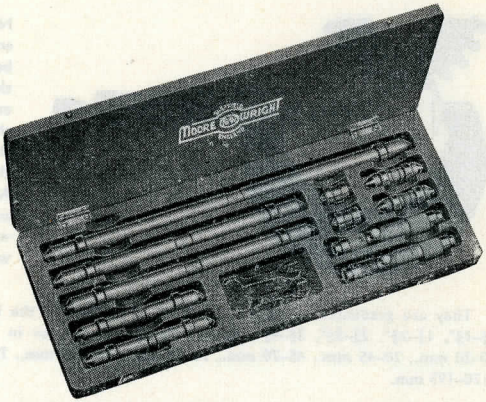


| No. | Capacity | | | | |
|---|---|---|---|---|---|
| **891**/3" | 0–3" | with | 3 | rods. | Base 2½" |
| **891M**/75 mm. | 0–75 mm. | ,, | 3 | ,, | |
| **891**/6" | 0–6" | ,, | 6 | ,, | |
| **891M**/150 mm. | 0–150 mm. | ,, | 6 | ,, | |
| **891**/9" | 0–9" | ,, | 9 | ,, | |
| **891M**/225 mm. | 0–225 mm. | ,, | 9 | ,, | |
| **891**/12" | 0–12" | ,, | 12 | ,, | |
| **891M**/300 mm. | 0–300 mm. | ,, | 12 | ,, | |
| **892**/3" | 0–3" | ,, | 3 | ,, | Base 4" |
| **892M**/75 mm. | 0–75 mm. | ,, | 3 | ,, | |
| **892**/6" | 0–6" | ,, | 6 | ,, | |
| **892M**/150 mm. | 0–150 mm. | ,, | 6 | ,, | |
| **892**/9" | 0–9" | ,, | 9 | ,, | |
| **892M**/225 mm. | 0–225 mm. | ,, | 9 | ,, | |
| **892**/12" | 0–12" | ,, | 12 | ,, | |
| **892M**/300 mm. | 0–300 mm. | ,, | 12 | ,, | |

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# END MEASURING MICROMETER SETS

SUPPLIED TO MACHINE TOOL MANUFACTURERS




These are used to facilitate jig-boring on Vertical and Universal Milling Machines, etc.

The illustration shows a No. **788C** Set, consisting of 2 Micrometers, 2 each 1″, 2″, 4″ and 8″ Rods and 1—12″ Rod. This is the Combined Set for longitudinal, cross and vertical measurements.

We also manufacture the following Sets :—

No. **788A** ..... 1 Micrometer ; 1 each 1″, 2″, 4″, 8″ and 12″ Rods. Used for longitudinal measurements.

No. **788B** ..... 1 Micrometer ; 1 each 1″, 2″, 4″ and 8″ Rods. Used for vertical or cross measurements.

Corresponding Metric sizes are also catered for.

The Micrometer supplied with a Longitudinal Set has a red identification sleeve, and the one with a Cross or Vertical Set has a green identification sleeve.

If Micrometers only are ordered, the colour of the identification sleeve must be specified.

No. **788** ... Micrometer with a 1″ movement of screw graduated to read in 1/10,000's of an inch.

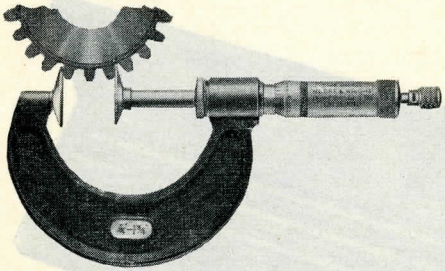
No. **788M** As No. 788, but with a 25 mm. movement of screw and graduated to read in 1/100's of a millimetre.

The Rods are accurate in length to within 0·00005″. The movement of the Micrometer is within the same limit of accuracy. The location collars are $\frac{3}{8}$″ diameter.

Machine Tool Manufacturers' requirements will be quoted for on request.

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# GEAR TOOTH MICROMETERS



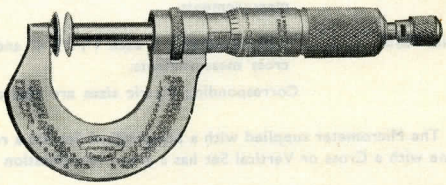
**No. 937** These Micrometers are for measuring the distance between Gear Teeth. All but the 0–¾″ have black crackle enamelled frames with Pearl chrome plated sleeves and thimbles. The 0–¾″ is Pearl chrome plated throughout. All are supplied with ratchets and locknuts in hinged-lid wooden cases, complete with setting key.

They are graduated to read in 1/1000's of an inch in the following capacities:—0–¾″, ¾–1¾″, 1¾–2¾″, 2¾–3¾″, 3¾–4¾″, 4¾–5¾″, 5¾–6¾″, 6¾–7¾″, or in 1/100's of a millimetre:—0–20 mm., 20–45 mm., 45–70 mm., 70–95 mm., 95–120 mm., 120–145 mm., 145–170 mm., 170–195 mm.

When ordering please give the catalogue number and capacity, e.g. No. **937/0–¾″**, or No. **937M/0–20 mm.**

# DISC ANVIL TYPE MICROMETERS

**No. 934** These Micrometers are for measuring narrow forms and recesses, and for taking difficult measurements inaccessible to ordinary Micrometers.



The Discs are ½″ in diameter, 1/16″ thick in the centre, and ·015″ thick at the edge. In two capacities, the 0–1″ is Pearl chrome plated throughout and the 1–2″ size has a black crackle enamel frame with Pearl chrome plated sleeve and thimble. The 0–1″ is supplied with a ratchet and locknut, and the 1–2″ with a ratchet, but not a locknut.

The 0–1″ is supplied in a spring-hinged pocket case, and the 1–2″ in a wooden case complete with setting key.

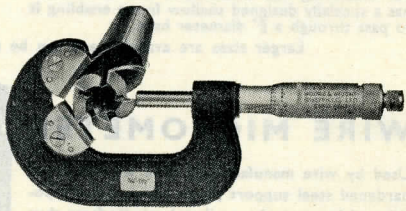
These Micrometers are graduated to read in 1/1000's of an inch, or 1/100's of a millimetre.

When ordering please give the catalogue number and capacity, e.g. No. **934/0–1″**, or No. **934M/0–25 mm.**

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS WITH "VEE" ANVILS

These Micrometers are designed to measure 3, 5 or 7 Flute Drills, Reamers, Taps, etc.



They are **direct reading,** quick and accurate in use and have obvious advantages over the costly ring gauges which they replace. They enable tools to be measured without removing them from the machine and without recourse to more elaborate devices.

The anvil and spindle faces are tungsten-carbide to withstand the wear caused by the cutting edges of hardened tools. The screws are hardened and thread ground and the frames are black crackle finished.

These tools are supplied in wooden cases complete with setting keys.

**973** ($\frac{1}{16}$"– $\frac{1}{2}$") for 3 fluted articles or multiples of 3

( $\frac{1}{2}$"–1") " "

(1" –1$\frac{1}{2}$") " "

(1$\frac{1}{2}$"–2") " "

(2" –2$\frac{1}{2}$") " "

(2$\frac{1}{2}$"–3") " "

(3" –3$\frac{1}{2}$") " "

(3$\frac{1}{2}$"–4") " "

**975** ($\frac{1}{16}$"– $\frac{3}{4}$") for 5 fluted articles

( $\frac{3}{4}$"–1$\frac{1}{4}$") " "

(1$\frac{1}{4}$"–2$\frac{1}{4}$") " "

(2$\frac{1}{4}$"–3") " "

(3" –3$\frac{3}{4}$") " "

**977** ($\frac{1}{16}$"–1") for 7 fluted articles

(1" –2") " "

(2" –3") " "

(3" –4") " "

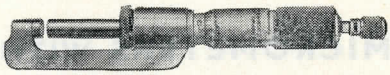
**PRICES ON REQUEST**

These Micrometers can be supplied with metric graduations

Please add "M" to number when ordering

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# HUB MICROMETER



For measuring hub thicknesses, this micrometer has a specially designed shallow frame enabling it to pass through a $\frac{3}{4}$" diameter hole.

No. **939** 0-1 capacity
No. **939M** 0-25 mm. capacity

Larger sizes are available and can be quoted for on request.

# WIRE MICROMETER

Used by wire manufacturers. The wire rests on hardened steel support plates and is quickly positioned between the anvil and spindle faces thus facilitating measurements.

Supplied in a morocco case.

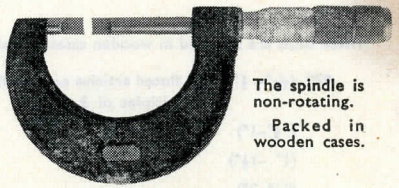
No. **470** with a capacity of :
0-$\frac{1}{2}$" for round wire.
0-$\frac{3}{8}$" for strip.
Reading in 1/1,000's of an inch.

No. **470M** with a capacity of :
0-6 mm. for round wire.
0-10 mm. for strip.
Reading in 1/1,000's of a mm.

# BLADE TYPE MICROMETERS

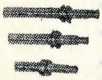
For measuring grooves and recesses on circular form tools and work of a similar nature. The blade thickness is 0·030" for a length of $\frac{7}{32}$" so that measurements may be taken in comparatively narrow and deep grooves.

| No. **929** | No. **929M** |
|---|---|
| Capacity 0-1" | Capacity 0-25 mm. |
| 1-2" | 25-50 mm. |
| 2-3" | 50-75 mm. |
| 3-4" | 75-100 mm. |
| Reading in 1/1,000's of an inch. | Reading in 1/100's of a mm. |



The spindle is non-rotating.

Packed in wooden cases.



# OVER-THE-BAR INSIDE MICROMETERS

This micrometer is for measuring internal diameters of a bore without removing the boring bar. The bow of the frame is clear of the specified bar diameter within the capacity stated.

No. **469**

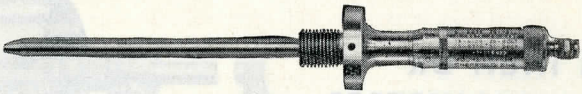
| Range | To cover bar diameter |
|---|---|
| 8-10" | 3" |
| 10-12" | 4$\frac{1}{2}$" |
| 12-14" | 6" |
| 14-18" | 7" |
| 18-24" | 8" |
| 24-32" | 9" |
| 32-40" | 12" |

| Range | To cover bar diameter |
|---|---|
| 200-250 mm. | 75 mm. |
| 250-310 mm. | 120 mm. |
| 310-360 mm. | 150 mm. |
| 360-450 mm. | 180 mm. |
| 450-600 mm. | 200 mm. |
| 600-800 mm. | 230 mm. |
| 800-1,000 mm. | 300 mm. |

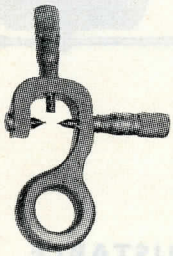
**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# MICROMETERS FOR SPECIAL PURPOSES

We are prepared to make special micrometers for a large variety of purposes. Customers are invited to submit drawings and specifications of their requirements for our attention and quotation. The illustrations below show a few of the many we have made.

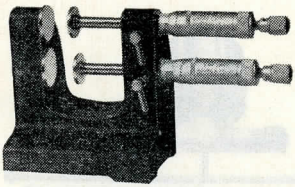


For measuring the wear down of turbine bearings and similar work.
Many varieties are available.

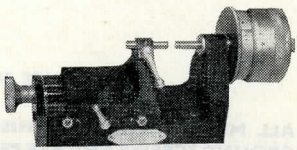


Micrometer with two heads for measuring trolley wire.

Micrometer used in Constructional Engineering for measuring variations in bolt lengths.



Limit micrometer with large flanges for measuring coil springs. Designed for bench work.

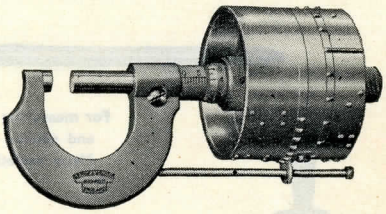


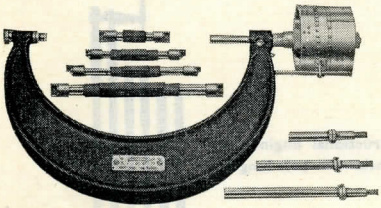
Special purpose bench micrometer fitted with large head.

# BRAILLE MICROMETERS

All Braille Micrometers can be supplied in English and Metric Graduations.

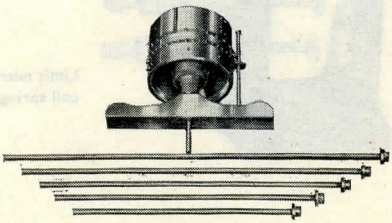
## 1 INCH OR 25 MILLIMETRES MICROMETER





## ADJUSTABLE MICROMETER

## DEPTH GAUGE MICROMETER

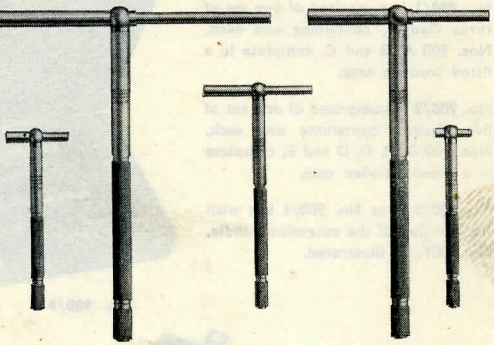


*FOR USE BY BLINDED TECHNICIANS.*

**ALL MICROMETERS ON THIS PAGE HAVE HARDENED AND THREAD GROUND SCREWS AND ARE PEARL CHROME PLATED FOR EASY READING**

# TELESCOPIC GAUGES

These Precision Gauges are specially designed for use either as comparators or for taking internal measurements in conjunction with External Micrometers.



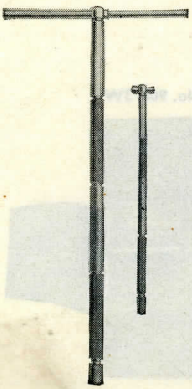
900B 900E 900C 900D 900A

All working parts are made of a high-grade Alloy Steel. The measuring faces are hardened and radiused to take the smallest diameter measurement for each size of Gauge.

The handle, in which is fitted a simple but efficient locking device, is Pearl chromium plated with a knurled hand grip.

These Gauges are very accurate and rigid in use.

| No. | | | | |
|---|---|---|---|---|
| **900A** | ... | $\frac{1}{2}$″– $\frac{3}{4}$″ | or | 12·7 – 19·0 mm. |
| **900B** | ... | $\frac{3}{4}$″– 1$\frac{1}{4}$″ | or | 19·0 – 31·7 mm. |
| **900C** | ... | 1$\frac{1}{4}$″– 2$\frac{1}{8}$″ | or | 31·7 – 53·9 mm. |
| **900D** | ... | 2$\frac{1}{8}$″– 3$\frac{1}{2}$″ | or | 53·9 – 88·9 mm. |
| **900E** | ... | 3$\frac{1}{2}$″– 6″ | or | 88·9 –152·4 mm. |
| **900F** | ... | 5$\frac{1}{2}$″– 8″ | or | 139·7 –203·2 mm. |
| **900G** | ... | 8″ –10$\frac{1}{2}$″ | or | 203·2 –266·7 mm. |
| **900H** | ... | 10$\frac{1}{2}$″–13″ | or | 266·7 –330·2 mm. |



# EXTENSION HANDLES FOR TELESCOPIC GAUGES

No. 900Y is the Extension Handle to be used with Nos. 900A, B and C Telescopic Gauges. It adds approximately 3$\frac{3}{4}$″ to the length of each Gauge.

To operate, the locking nut in the end of the existing handle should be removed and the extension handle screwed on in its place. The locking nut should then be screwed into the end of the extension handle, so bringing the efficient locking device into action.

No. 900Z is to be used with Nos. 900D, E, F, G and H Telescopic Gauges, adding approximately 5$\frac{3}{4}$″ to the length of each Gauge. It is operated in a similar fashion to No. 900Y.

No. **900Y** Approx. 3$\frac{3}{4}$″ long. No. **900Z** Approx. 5$\frac{3}{4}$″ long.

# TELESCOPIC GAUGES IN CASES

No. **900/1** is comprised of one set of three Gauges, containing one each, Nos. 900 A, B and C, complete in a fitted wooden case.

No. **900/2** is comprised of one set of five Gauges, containing one each, Nos. 900 A, B, C, D and E, complete in a fitted wooden case.

No. **900/3** is as No. 900/1 but with the addition of the extension handle, No. 900Y, as illustrated.

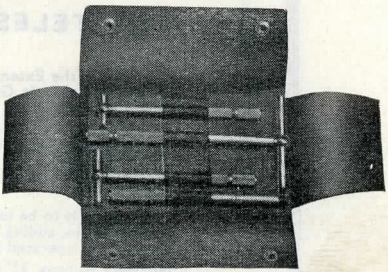
No. **900/3**

No. **900/4**

No. **900/4** is as No. 900/2 but with the addition of the extension handles, Nos. 900Y and 900Z, as illustrated.

No. **900/5** is comprised of one set of 3 Gauges, containing one each, Nos. 900 F, G and H with one extension handle No. 900Z. Complete in fitted wooden case.

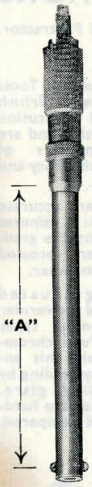
No. **900/3W**



These sets of Telescopic Gauges, except No. 900/5 can be supplied in black plastic lined wallets, which are not only neat and compact, but are strong enough to give adequate protection to the Gauges.

They should be ordered by adding the letter "W" to the number, e.g. 900/1W.

# SMALL HOLE GAUGES




**THESE INEXPENSIVE TOOLS ARE USED TO ACCURATELY MEASURE SMALL HOLES, SLOTS, GAPS, ETC. BY USING IN CONJUNCTION WITH AN EXTERNAL MICROMETER**

These tools are different to the small hole gauges at present available, this improved type makes measuring contact by the use of hardened and spherically lapped balls, which give a definite "feel" with a complete absence of springing. The balls have completely free movement, and for this reason do not wear at any one spot.

The measuring balls are moved and locked into position by a precision tapered rod, hardened and ground at both ends to ensure the minimum of wear.

These tools are well balanced and sensitive in use. The knurled handle is Pearl chrome plated and the steel body which contains the measuring balls and clamping mechanism is very strong and accurately machined.

To use, simply loosen the top knurled clamp, insert the instrument into the hole, slot or gap, tightening the top clamp until contact is made. The gauge should then be removed and a measurement taken over the balls by means of a micrometer.

| | | | | | |
|---|---|---|---|---|---|
| **899AA** | Capacity | ·0625–·080″ | or | 1·59–2·03 mm. | Length **"A"** $\frac{9}{16}$″ approx. |
| **899BB** | ,, | ·080 –·095″ | ,, | 2·03–2·41 mm. | ,, $\frac{9}{16}$″ ,, |
| **899CC** | ,, | ·095 –·110″ | ,, | 2·41–2·79 mm. | ,, $\frac{9}{16}$″ ,, |
| **899DD** | ,, | ·110 –·125″ | ,, | 2·79–3·2 mm. | ,, $\frac{9}{16}$″ ,, |
| **899A** | ,, | ·125 –·150″ | ,, | 3·2 –3·8 mm. | ,, $2\frac{1}{8}$″ ,, |
| **899B** | ,, | ·150 –·175″ | ,, | 3·8 –4·5 mm. | ,, $2\frac{1}{8}$″ ,, |
| **899C** | ,, | ·175 –·200″ | ,, | 4·5 –5·1 mm. | ,, $2\frac{1}{8}$″ ,, |
| **899D** | ,, | ·200 –·250″ | ,, | 5·1 –6·4 mm. | ,, $2\frac{3}{4}$″ ,, |
| **899E** | ,, | ·250 –·312″ | ,, | 6·4 –8·0 mm. | ,, $2\frac{3}{4}$″ ,, |
| **899F** | ,, | ·312 –·375″ | ,, | 8·0 –9·6 mm. | ,, $3\frac{1}{2}$″ ,, |
| **899G** | ,, | ·375 –·500″ | ,, | 9·6–12·7 mm. | ,, $3\frac{1}{2}$″ ,, |

These tools can also be supplied in 6 sets as follows :

Set No. **899 W/1**

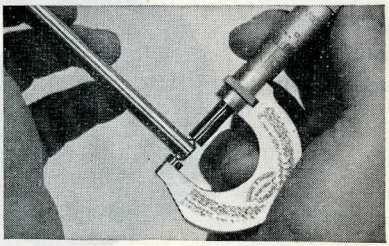
This set is made up of Nos. 899 A, B and C.

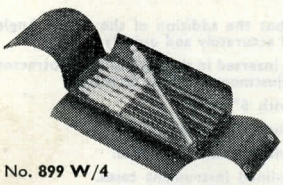
Set No. **899 W/2**

This set is made up of Nos. 899 D and E.

Set No. **899 W/3**

This set is made up of Nos. 899 F and G.





No. **899 W/4**

Set No. **899 W/4**

This set contains 7 gauges, Nos. 899 A, B, C, D, E, F and G.

Set No. **899 W/5**

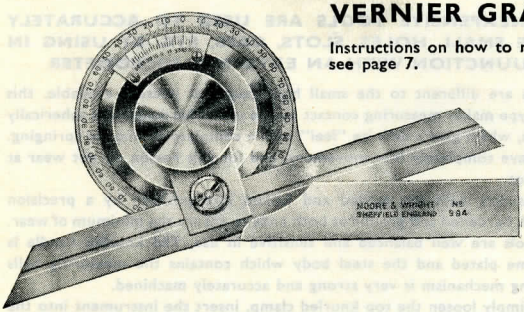
This set is made up of Nos. 899 AA, BB, CC and DD.

Set No. **899 W/6**

This set contains all 11 gauges, Nos. 899 AA, BB, CC, DD, A, B, C, D, E, F and G.

# BEVEL PROTRACTORS WITH VERNIER GRADUATIONS

Instructions on how to read a Bevel Protractor, see page 7.




These Precision Tools are made to British Standard Institution Specification and are Instruments of proved efficiency and accuracy.

They are accurate to within 5 minutes of arc, and the graduations are recessed to prevent wear.

The graduated scales and the vernier plates on all types have a Pearl chromium finish; this ensures easy reading by eliminating glare. The blades are hardened and tempered.

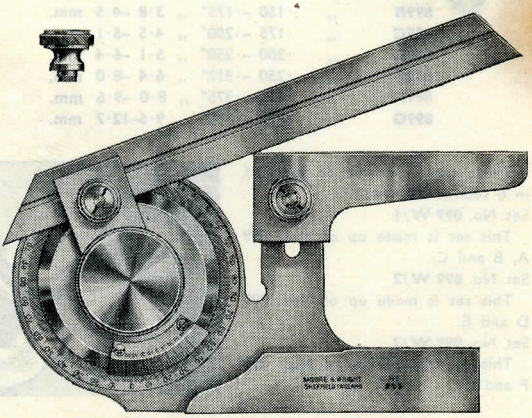
Both 6″ and 12″ blades have bevelled ends, which will be found very useful when working in awkward corners.

**No. 994A** Vernier Bevel Protractor, complete with a 6″ blade.

**No. 994B** Vernier Bevel Protractor, complete with a 12″ blade.

**No. 994C** Vernier Bevel Protractor, complete with 6″ and 12″ blades.

WITH ACUTE ANGLE ATTACHMENT AND FINE ADJUSTMENT



These Protractors are similar to the No. 994 Type but the addition of the Acute Angle Attachment enables very small angles to be measured accurately and quickly.

A small pinion thumb screw is supplied which can be inserted in the back of the Protractor to engage a gear which moves the vernier with fine adjustment in either direction.

**No. 995A** Vernier Bevel Protractor, complete with 6″ blade.

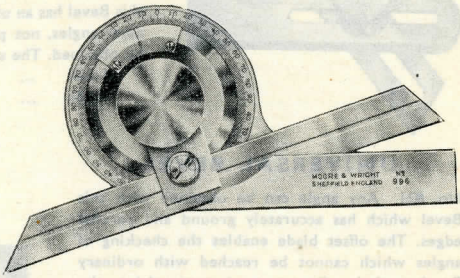
**No. 995B** Vernier Bevel Protractor, complete with 12″ blade.

**No. 995C** Vernier Bevel Protractor, complete with 6″ and 12″ blades.

**Bevel Protractors are supplied complete in velvet-lined instrument cases.**

# BEVEL PROTRACTOR
## WITHOUT VERNIER GRADUATION

Instructions on how to read a Bevel Protractor, see page 7.




The No. **996** Bevel Protractor although manufactured without the vernier scale is just as accurately made as Nos. **994** and **995.**

No. **996A** Bevel Protractor, complete with 6″ blade.

No. **996B** Bevel Protractor, complete with 12″ blade.

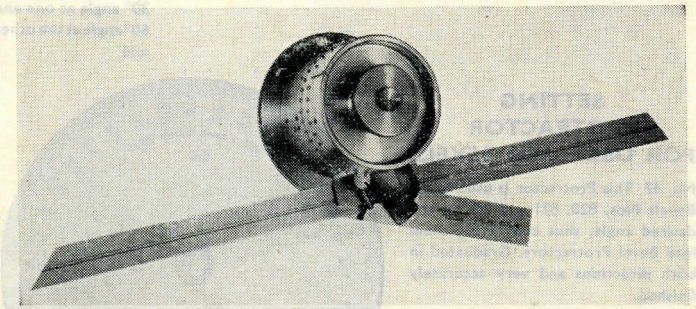
No. **996C** Bevel Protractor, complete with 6″ and 12″ blades.

Bevel Protractors are supplied complete in velvet-lined instrument cases.

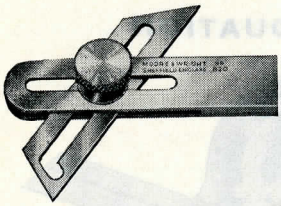
# BRAILLE BEVEL PROTRACTOR

For the use of Blinded Technicians.

Supplied complete in a fitted wooden case.



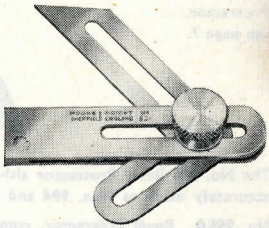
# ENGINEERS' BEVELS



## PLAIN BEVEL

No. **820** Accurately ground with parallel edges, this Bevel has an offset slot in the blade which enables angles, not possible with a straight slot, to be obtained. The stock lies flat on the work.

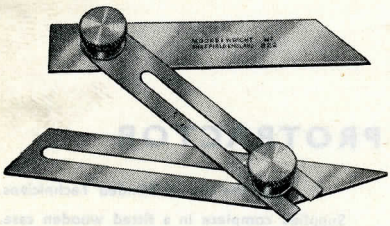
| | | |
|---|---|---|
| Stock | ... ... | 3″ long × $1\frac{1}{16}$″ wide |
| Blade | ... ... | 3″ long × $\frac{5}{8}$″ wide |



## UNIVERSAL BEVEL

No. **821** Any angle can be obtained with this Bevel which has accurately ground and parallel edges. The offset blade enables the checking of angles which cannot be reached with ordinary Bevels, and the clamp screw is recessed into the stock allowing it, if necessary, to lie flat on the work.

| | | |
|---|---|---|
| Stock | ... ... | 3″ long × $1\frac{1}{16}$″ wide |
| Blade | ... ... | 3″ long × $\frac{5}{8}$″ wide |



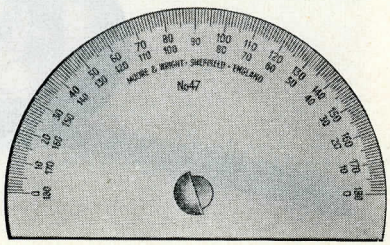
## COMBINATION BEVEL

No. **822** This Combination Bevel consists of stock, split blade and auxiliary blade, all of which are accurately ground and parallel. The split blade swings to any angle and with the auxiliary blade attached, angles can be transferred from one surface to another, work can be laid out, or any desired angle confirmed and measured The stock and auxiliary blade can be laid flat on the work.

| | |
|---|---|
| Stock... ... | $4\frac{1}{4}$″ long × $\frac{3}{4}$″ wide<br>45° angle at one end |
| Auxiliary Blade | $4\frac{7}{8}$″ × $\frac{3}{4}$″ wide<br>30° angle at one end<br>60° angle at the other end |

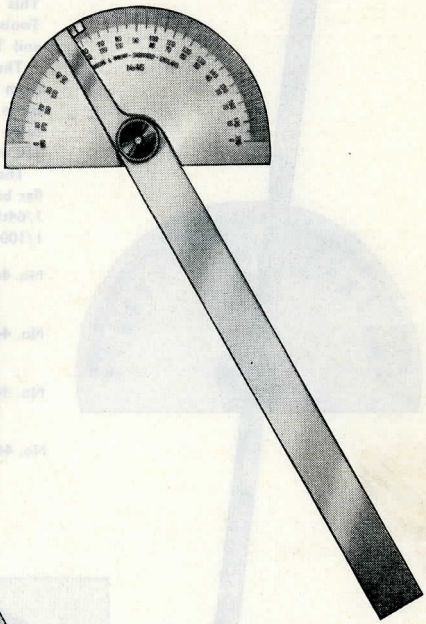
## SETTING PROTRACTOR FOR USE WITH BEVELS

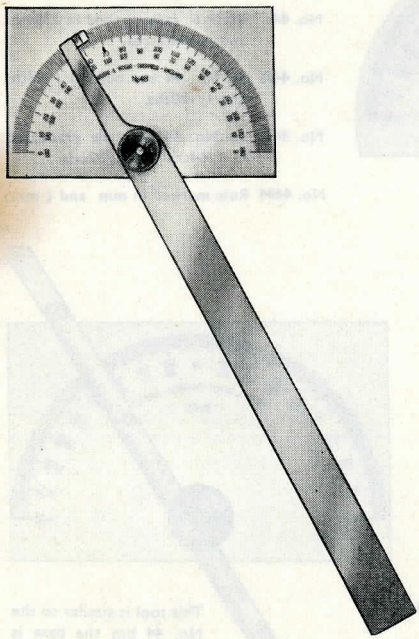
No. **47** This Protractor is used to set Bevels Nos. 820, 821 and 822 to any desired angle, thus converting them into Bevel Protractors. Graduated in both directions and very accurately finished.



# PROTRACTORS
## FOR THE ENGINEER AND MACHINIST

No. **46** Graduated in degrees from 0–180° and from 180–0°. The blade is 6″ long from the working edge of the protractor, and the spring loaded locking nut has a very positive action.

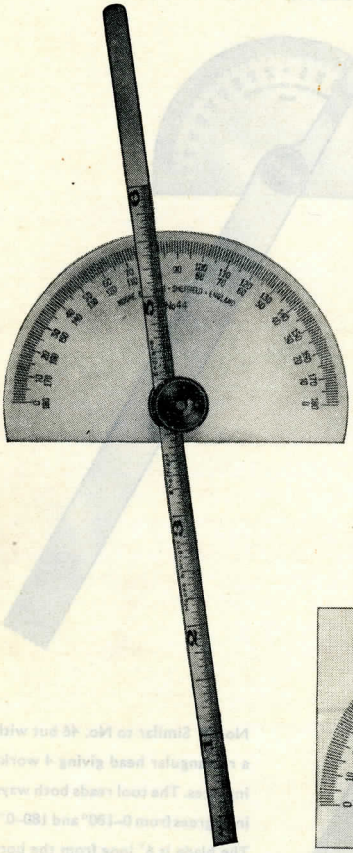




No. **48** Similar to No. 46 but with a rectangular head giving 4 working faces. The tool reads both ways in degrees from 0–180° and 180–0°. The blade is 6″ long from the bottom working edge.

These two Protractors are accurately graduated and will be found convenient in use by all engineers, machinists and mechanics, etc. They are handy tools for setting bevels, transferring angles and on other jobs where angles need to be measured. The backs of both Protractors are smooth and flat.

# DEPTH GAUGES WITH PROTRACTOR



This addition to our range of Precision Tools will be welcomed by all Engineers and Technicians.

The Protractor is graduated in degrees from 0–180° and from 180–0°. Any angle up to 180° can be obtained, as can, because of its adjustable blade, any depth to 6″ or 150 mm.

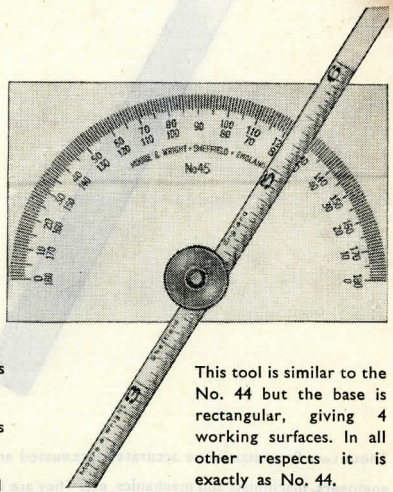
The Protractor is finished with a smooth flat back, and the blades are graduated in 1/64ths and millimetres, 1/64ths and 1/100ths or millimetres and ½ millimetres.

No. **44** With 6″ rule marked in 1/64ths and millimetres.

No. **44A** As No. 44 but rule in 1/64ths and 1/100ths.

No. **44C** As No. 44 but rule graduated in 1/64ths and 1/32nds.

No. **44M** Rule marked in mm and ½ mm.




No. **45** With 6″ rule marked in 1/64ths and millimetres.

No. **45A** As No. 45 but rule in 1/64ths and 1/100ths.

No. **45C** As No. 45 but rule graduated in 1/64ths and 1/32nds.

No. **45M** Rule marked in mm. and ½ mm.

This tool is similar to the No. 44 but the base is rectangular, giving 4 working surfaces. In all other respects it is exactly as No. 44.

# COMBINATION SQUARES

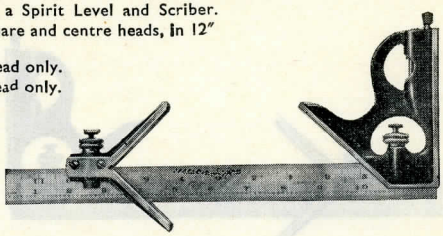
## WITH DROP FORGED STEEL HEADS AND HARDENED AND TEMPERED BLADES

The Square Head is fitted with a Spirit Level and Scriber.

No. **990** Complete with rule, square and centre heads, in 12″ 18″ and 24″ sizes.

No. **989** With rule and square head only.

No. **988** With rule and centre head only.



Spare Parts :—Square Head, Centre Head, 12″ Rule, 18″ Rule, 24″ Rule.

# COMBINATION SETS

## WITH DROP FORGED STEEL HEADS AND HARDENED AND TEMPERED BLADES

The protractors are graduated to read from zero to 180° in both directions, as shown in the illustration.

A new reversible bolt is now fitted on all models which ensures the easy insertion of the blade.

A level is fitted to both the square and protractor heads.

The rules, which are accurately graduated, are hardened and tempered, and are accurate straight edges.

The heads slide smoothly in the groove.

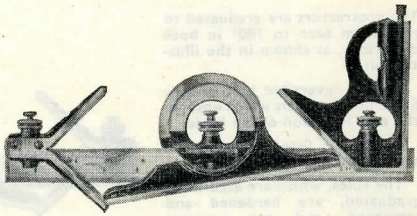
No. **990P** Complete with square head, centre head, protractor and rule, in 12″, 18″ and 24″ sizes.

No. **988P** With centre head, protractor and rule.

No. **989P** With square head, protractor and rule.

No. **990P/1** With rule and protractor only.

Spare Parts :—Square Head, Centre Head, Protractor, 12″ Rule, 18″ Rule, 24″ Rule.

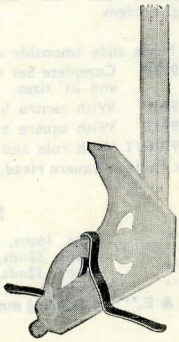


# SPRING CLIP

## FOR COMBINATION SQUARES

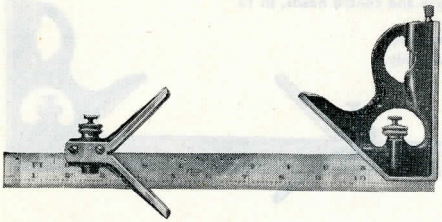
No. **987** This Spring Clip is a most useful attachment for Combination Squares. With it in position, as illustrated, the square stands upright and is not easily knocked over.

One is given free with each Combination Square and Set Nos. 990, 990P, 992 and 992P.



# COMBINATION SQUARES

## WITH HARDENED DROP FORGED STEEL HEADS AND HARDENED AND TEMPERED BLADES



Each square head is fitted with a level and scriber. The heads are drop forged and hardened, and are practically unbreakable.

The rules are hardened and tempered.

The working faces are wide and guaranteed accurate.

A new reversible bolt is fitted on all models.

No. **992** Complete with rule, square and centre heads, in 12″, 18″ and 24″ sizes.
No. **991** With rule and square head only.
No. **993** With rule and centre head only.
Spare Parts :—Square Head, Centre Head, 12″ Rule, 18″ Rule, 24″ Rule.

# COMBINATION SETS

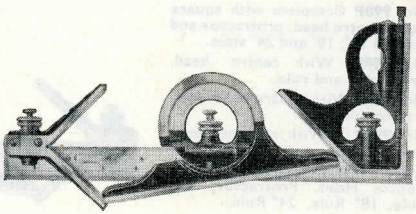
## WITH HARDENED AND DROP FORGED STEEL HEADS AND HARDENED AND TEMPERED BLADES

The protractors are graduated to read from zero to 180° in both directions, as shown in the illustration.

A new reversible bolt is now fitted on all models which ensures the easy insertion of the blade.

A level is fitted to both the square and protractor heads.

The rules, which are accurately graduated, are hardened and tempered, and are accurate straight edges.

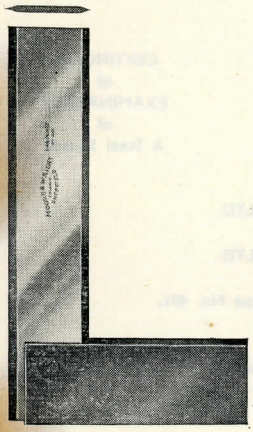


The heads slide smoothly on the groove.
No. **992P** Complete Set with protractor, square head, centre head and rule, in 12″, 18″ and 24″ sizes.
No. **993P** With centre head, protractor and rule.
No. **991P** With square head, protractor and rule.
No. **992P/1** With rule and protractor only.
Spare Parts :—Square Head, Centre Head, Protractor, 12″ Rule, 18″ Rule, 24″ Rule.

## RULE GRADUATIONS

| | | |
|---|---|---|
| **"A"** | 8ths, 16ths, 32nds, 64ths. | Please specify graduation required |
| **"B"** | 16ths, 32nds, 64ths, 100ths. | |
| **"C"** | 16ths, 32nds, 64ths, 50ths. | |
| **"M"** | 1 side in mm. and $\frac{1}{2}$ mm. Reverse side in mm. and $\frac{1}{2}$ mm. | |
| **"M. & E."** | 1 side in $\frac{1}{2}$ mm. and 32nds. Reverse side in mm. and 64ths. | |

# ENGINEERS' TRY-SQUARES
## REFERENCE GRADE



No. **401** Squares have been developed in conjunction with the National Physical Laboratory to produce a Square of the necessary accuracy to conform to British Standard Institution Specification No. 939, Reference Limits, with the exception of 24″ which conforms in all respects except length of blade, which is 24″ outside, not inside.

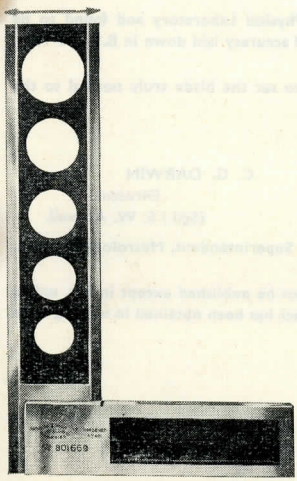
All sizes up to and including 12″ are made with solid blades with bevelled edges. Sizes 18″ and 24″ are made with relieved stocks and blades as illustrated below. All No. **401** Squares have hardened stocks and blades with glass-hard edges.

Supplied in the following sizes :

| | | |
|---|---|---|
| 2″ | 3″ | 4″ |
| 5″ | 6″ | 9″ |
| 12″ | 18″ | 24″ |

If N.P.L. Certificates are required they will be charged extra at cost, plus carriage to and from the Laboratory. A copy of an N.P.L. certificate is shown on page 64.

Up to 9″ each Square is supplied in a strong wooden box. Larger than 9″ Squares are supplied in strong wooden sheaths.



# COPY OF N.P.L. CERTIFICATE ISSUED ON A STEEL SQUARE

N.P.L. Seal

CERTIFICATE
of
EXAMINATION
of
A Steel Square

Sent by :— Messrs. MOORE & WRIGHT (Sheffield) LTD.

Made by :— Messrs. MOORE & WRIGHT (Sheffield) LTD.

Description :— A 12 inch hardened steel Try Square, type No. 401.

Marked :— B358
Moore & Wright, Sheffield, England
Hardened No. 401

REFERENCE 641

Marked at the Laboratory :—NPL '44
Grade of Test :—B.S. 939-1941 (Reference).

---

This Square has been examined at the National Physical Laboratory and found to be satisfactory in all respects to the "Reference" grade of accuracy laid down in B.S. 939-1941.

Note.—In using this Square care should be taken to set the blade truly normal to the object under test.

This Square has been marked NPL '44.
Date 4th December, 1944.
Reference M.M. 130-50
M.11406.

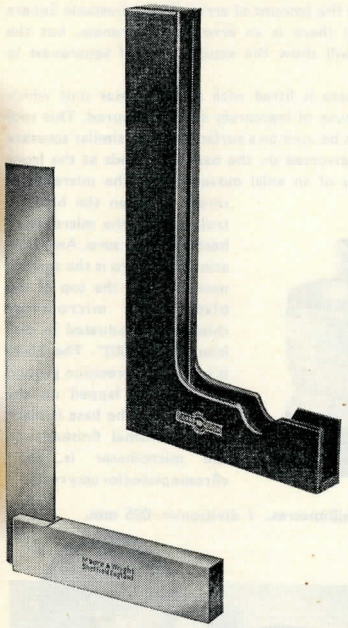
C. G. DARWIN
Director.
(Sgd.) S. W. Attwell.
for Superintendent, Metrology Division.

Checked by J.B.

A Laboratory Certificate, Statement or Report may not be published except in full, unless permission for the publication of an approved abstract has been obtained in writing from the Director.

# ENGINEERS' TRY-SQUARES

## INSPECTION GRADE



No. **402** With hardened stocks and blades with glass-hard edges. A square of the highest precision, guaranteed to maintain permanent stability of form.

All sizes except 24″ and upwards are made to conform to British Standard Institution Specification No. 939, Inspection Limits. The 24″ conforms in all respects except in length of blade, which is 24″ measured on the outside. There is no British Standard Institution Specification for over 24″ sizes.

Supplied in the following sizes :

| | | | |
|---|---|---|---|
| 2″ | 3″ | 4″ | 5″ |
| 6″ | 9″ | 12″ | 18″ |
| 24″ | 30″ | 36″ | |

*Squares* 18″ *and upwards are supplied in strong wooden sheaths, as illustrated.*

# ENGINEERS' TRY-SQUARES

## WORKSHOP GRADE

No. **400** These **precision ground** squares have been introduced to meet the demand for accurate tools for use by the engineer on production work.

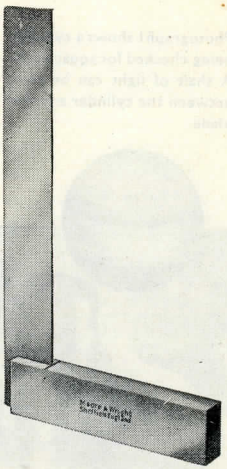
The square blades are hardened and tempered.

All except 24″ and upwards are made to conform to British Standard Institution Specification No. 939, Workshop Limits. The 24″ size conforms in all respects except length of blade, which is 24″ outside. There is no British Standard Institution Specification for over 24″ sizes.

Supplied in the following sizes :

| | | | | | |
|---|---|---|---|---|---|
| 2″ | 3″ | 4″ | 5″ | 6″ | 9″ |
| 12″ | 18″ | 24″ | 30″ | 36″ | 42″ |

*Squares* 18″ *and upwards are supplied in strong wooden sheaths, as illustrated above.*



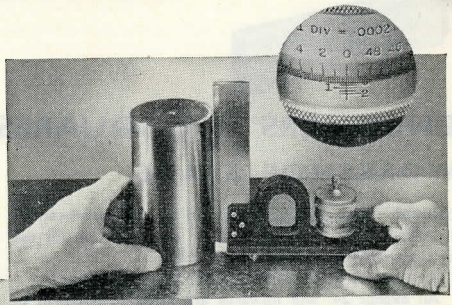
# ADJUSTABLE SQUARE

No. **420/6**″ The Moore & Wright Adjustable Square is an entirely new tool. It differs from a normal square which will show an error in squareness, but not the amount of error. The Adjustable Square will not only show if there is an error in squareness, but the micrometer reading will show the actual error of squareness at the top of the blade.

The Adjustable Square is fitted with a micrometer unit which enables the exact amount of inaccuracy to be measured. This tool must, of course, always be used on a surface plate or similar accurate surface. The blade is pivotted on the hardened studs at the front of the base by means of an axial movement of the micrometer screw. When the blade is truly square the micrometer head will read zero. Any deviation from zero is the squareness error at the top of the blade. The micrometer thimble is graduated in divisions of 0·0002″. The blade is hardened, precision ground all over and lapped on the bevel edge. The base is black crackle enamel finished and the micrometer is pearl chrome plated for easy reading.

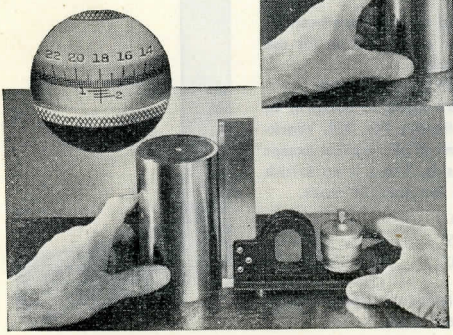
No. **420M/150** mm. As above graduated in millimetres. 1 division = ·005 mm.

Photograph 1 shows a cylinder being checked for squareness. A shaft of light can be seen between the cylinder and the blade.



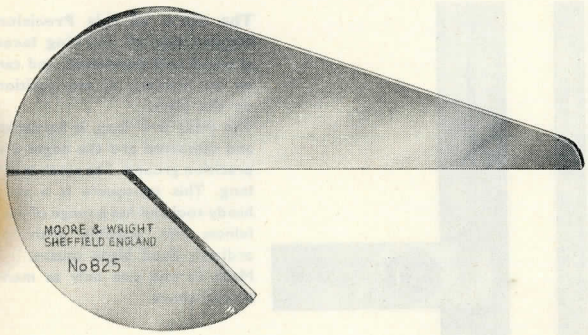

Photograph 1

By turning the micrometer head the base will be tilted and the blade will come in contact with the cylinder all the way up (Photograph 2). The error of squareness can then be read from the micrometer head.




Photograph 2

# CENTRE SQUARES

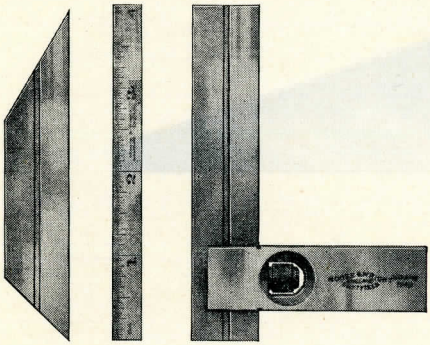



Cat. No. **825A**
For work up to 1½″ diameter

Cat. No. **825B**
For work up to 3″ diameter

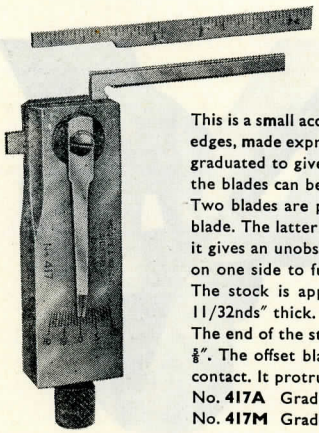
The Moore & Wright Centre Square is an inexpensive tool for rapidly and accurately finding the centre of the face of round bars or discs within the sizes mentioned. It is equally useful to the machinist on the lathe, or the toolmaker at the bench, and will prove a valuable addition to their tool kit. The Centre Square is made of good quality tool steel, the blade being of hardened and tempered strip.

# ADJUSTABLE TRY-SQUARE



**The stock of this Precision Square has all working faces ground and hardened,** and can be set instantly at any position on the blade.
The blade is 4″ long, is hardened and tempered and the edges are precision ground. The stock is 2½″ long. This try-square is a very handy tool and has a range of usefulness not possible with an ordinary fixed blade square.
Made in one size only as mentioned above.

No. **414** With a plain square blade.
No. **415A** „ „ „ and a narrow rule blade graduated in 1/64ths.
No. **415B** As above, but rule graduated in 1/100ths.
No. **415M** As above, „ „ ½ mm.
No. **416A** Complete, as illustrated, with three blades, rule graduated in 1/64ths.
No. **416B** „ „ „ „ „ 1/100ths.
No. **416M** „ „ „ „ „ ½ mm.



# DIE MAKERS' SQUARE

This is a small accurate square, hardened and ground on all working edges, made expressly for the tool and die maker The Stock is finely graduated to give an angular reading of 10 degrees either way, and the blades can be set and clamped positively in any position.
Two blades are provided, a graduated straight blade and an offset blade. The latter will be found especially useful on die work where it gives an unobstructed view. The edges of the stock are cut away on one side to further assist in this direction.
The stock is approximately 2–1/16th″ long, 21/32nds″ wide and 11/32nds″ thick. The straight blade is 2¼″ long and 5/32nds″ wide. The end of the straight blade is reduced to 3/32nds″ for a length of ⅝″. The offset blade is ⅛″ wide and has bevelled edges to give line contact. It protrudes approximately 1½″ from the stock.
No. **417A** Graduated 1 side in 1/64ths. 1 side in 1/32nds.
No. **417M** Graduated 1 side in millimetres. 1 side in ½ millimetres.

# ENGINEERS' STRAIGHT EDGES

Finished Ground all over. Marked at Supporting Points on the 36″ size and longer. Both Edges of Nos. 308 to 311 are finished to British Standard Specification 863, Grade "B", but the edges of No. 312 are finished to Grade "A" of the same Specification.

| **Catalogue No. 308 Not Hardened** LIGHT SECTION | | | **Catalogue No. 309 Not Hardened** HEAVY SECTION | | |
|---|---|---|---|---|---|
| Length | Width | Thickness | Length | Width | Thickness |
| 12″ | 1¼″ | 3/16″ | 12″ | 1⅝″ | ¼″ |
| 18″ | 1⅝″ | ¼″ | 18″ | 2″ | 5/16″ |
| 24″ | 1⅝″ | ¼″ | 24″ | 2″ | 5/16″ |
| 30″ | 2″ | 5/16″ | 30″ | 2½″ | ⅜″ |
| 36″ | 2″ | 5/16″ | 36″ | 2½″ | ⅜″ |
| 48″ | 2½″ | ⅜″ | 48″ | 3″ | 7/16″ |
| 60″ | 3″ | 7/16″ | 60″ | 3½″ | ½″ |
| 72″ | 3″ | 7/16″ | 72″ | 4″ | ½″ |

Square Edges are supplied on all standard types. **If one edge is required bevelled add "B" to Catalogue Number. The bevel is 30°.**

N.P.L. Certificate supplied at extra cost.

Boxes for Straight Edges supplied at extra cost.

| **Catalogue No. 310 Hardened Edges** LIGHT SECTION | | | **Catalogue No. 311 Hardened Edges** HEAVY SECTION | | | **Catalogue No. 312 Hardened Edges** HEAVY SECTION | | |
|---|---|---|---|---|---|---|---|---|
| Length | Width | Thickness | Length | Width | Thickness | Length | Width | Thickness |
| 12″ | 1¼″ | 3/16″ | 12″ | 1⅝″ | ¼″ | 12″ | 1⅝″ | ¼″ |
| 18″ | 1⅝″ | ¼″ | 18″ | 2 ″ | 5/16″ | 18″ | 2″ | 5/16″ |
| 24″ | 1⅝″ | ¼″ | 24″ | 2″ | 5/16″ | 24″ | 2″ | 5/16″ |
| 30″ | 2″ | 5/16″ | 30″ | 2½″ | ⅜″ | 30″ | 2½″ | ⅜″ |
| 36″ | 2″ | 5/16″ | 36″ | 2½″ | ⅜″ | 36″ | 2½″ | ⅜″ |
| 48″ | 2½″ | ⅜″ | 48″ | 3″ | 7/16″ | 48″ | 3″ | 7/16″ |
| 60″ | 3″ | 7/16″ | 60″ | 3½″ | ½″ | 60″ | 3½″ | ½″ |
| 72″ | 3″ | 7/16″ | 72″ | 4″ | ½″ | 72″ | 4″ | ½″ |

# TOOLMAKERS' STRAIGHT EDGES
## WITH WORKING EDGES HARDENED

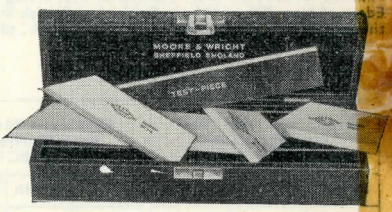
No. **315** In 2″, 3″, 4″, and 6″ lengths Section 1″ × $\frac{1}{8}$″.

No. **315S** Set of four, i.e. one each 2, 3, 4, 6 inch and one black glass test piece $6\frac{1}{2}$″ long, in Protective Case.

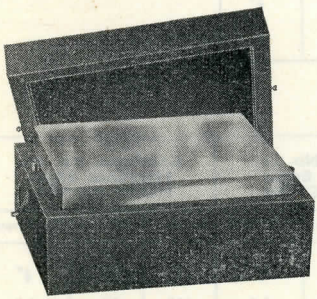
No. **315TP** Black Glass Test Piece only, in Sliding Case (when available).

We guarantee the error on these Straight Edges not to exceed ·0001″ on any of the sizes.

**Prices for Sets to British Standard Specification No. 852-1939 will be quoted on request.**




# TOOLMAKERS' SURFACE PLATE



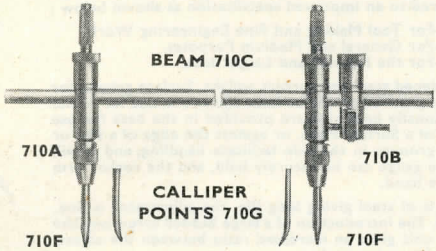
No. **506** These surface plates have been made specially for Tool Makers, Instrument Makers and other operators engaged on small work where a high degree of accuracy is required.

The surface is hardened, ground and mechanically lapped to very fine limits, and by reason of the long seasoning and treatment of the HARPER-MEEHANITE CASTING, coupled with the design and structure of the plate, it will permanently retain its flatness.

Each plate is sent out in a nicely-finished hardwood case of robust strength. The cover is specially made to lift off so that the plate can be used whilst still in the case.

Approx. size 6″ × $4\frac{1}{2}$″. Approx. weight 10 lbs.

# BEAM TRAMMELS



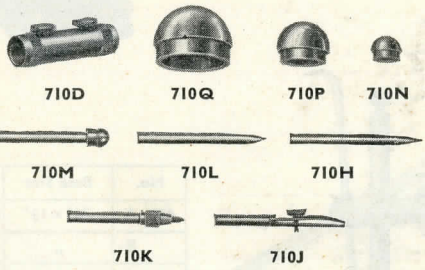

Moore & Wright Beam Trammels are made in Stainless Steel, and are of immense value to Draughtsmen as well as to Toolmakers, Mechanics, etc. Three sets are available as shown below :

No. **710/1** Consists of:—one each of No. **710A, B, C,** and two each of No. **710F, G.** Will describe a circle up to 21″. Supplied in a wooden box.

No. **710/2** Consists of:—one each No. **710A, B, C, H, J, K, L, M, N, P,** and **Q,** and two each of No. **710F** and **G.** To describe a circle up to 21″. Supplied in a velvet-lined leather covered case.

No. **710/3** As No. **710/2** but includes two extra, No. **710C** and No. **710D.** To describe a circle up to 69″. Supplied boxed as No. **710/2.**

## COMPONENTS AVAILABLE AS SEPARATE ITEMS :




No. **710A** FIXED TRAM WITH FINGER GRIP AND CHUCK.
No. **710B** ADJUSTABLE TRAM WITH FINGER GRIP AND CHUCK.
No. **710C** 12″ BEAM.
No. **710D** BEAM COUPLING WITH SCREWS.
No. **710F** SCRIBER POINTS.
No. **710G** CALLIPER POINTS.
No. **710H** NEEDLE POINTS
No. **710J** PEN POINTS.
No. **710K** PENCIL CHUCK.
No. **710L** ADAPTOR POINTS.
No. **710M** BALL POINT FOR HOLES UP TO $\frac{1}{4}$″ DIAMETER.
No. **710N** BALL END FOR HOLES $\frac{1}{4}$″ to $\frac{1}{2}$″ DIAMETER.
No. **710P** BALL END FOR HOLES $\frac{1}{2}$″ to 1″ DIAMETER.
No. **710Q** BALL END FOR HOLES 1″ to 1$\frac{1}{2}$″ DIAMETER.

# UNIVERSAL SURFACE GAUGES

These Surface Gauges are fully universal, high quality precision tools, manufactured to an improved specification as shown below :

No. **403** Series—For Tool Making and Fine Engineering Work.
No. **405** Series—For General and Medium Purposes.
No. **407** Series—For the Heavier and Larger Jobs.

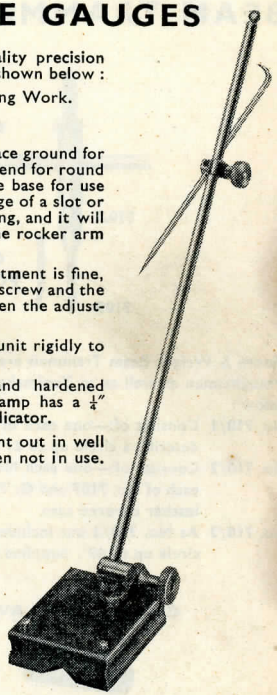
**Base** is of hardened steel and correct weight. Surface ground for flat work and vee grooved on the bottom and at one end for round work. Two frictionally held pins are provided in the base for use against the edge of a Surface Plate, or against the edge of a slot or slideway. Radial grooves in the side facilitate handling, and it will be noted that the gauge can be securely held, and the rocker arm adjusted with one hand.

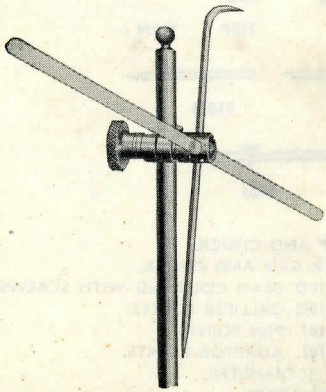
**Rocker Arm** is of steel giving long life, the adjustment is fine, smooth and rigid. The introduction of a large headed screw and the re-design of this unit gives an increased ratio between the adjustment screw and the rocker spring.

**Spindle Clamp** is designed to clamp the spindle unit rigidly to the rocker arm.

**Scriber Clamp** carries a correctly pointed and hardened scriber. On the 405 and 407 Series the scriber clamp has a $\frac{1}{4}$" diameter hole to hold the standard bar of a Dial Indicator.

**Packing.** All this Series of Surface Gauges are sent out in well made wooden cases, giving adequate protection when not in use.





The illustration above shows the Scriber Clamp which is also fitted with $\frac{1}{4}$ in. hole to hold the standard bar of a Dial Indicator.

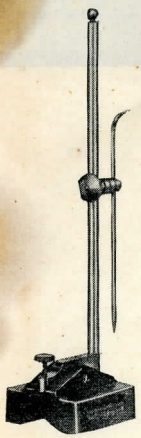
| No. | Base Size | Spindle Lengths |
|---|---|---|
| **403 A** | $2\frac{1}{8}$" × $1\frac{3}{4}$" | 1 only 4" |
| **B** | ,, | 1 each 4" & 7" |
| **C** | ,, | 1 only 7" |
| **405 A** | $3\frac{1}{8}$" × $2\frac{1}{2}$" | 1 only 9" |
| **B** | ,, | 1 each 9" & 12" |
| **C** | ,, | 1 only 12" |
| **407 A** | $4\frac{1}{8}$" × $3\frac{3}{8}$" | 1 only 12" |
| **B** | ,, | 1 each 12" & 18" |
| **C** | ,, | 1 only 18" |

# SURFACE GAUGES

This Surface Gauge has been introduced to meet the demand for a really reliable article at a small price. It is a handy tool, well proportioned and rigid. The post is of steel, and the base is heavy and accurately machined. The scribers are made from the best drill rod; the sliding head is cut from the solid bar, this being much superior to a casting, and the nut is of ample size to ensure a firm grip. Packed one in a box.

No. **404/6″** Turned Base with 6″ spindle.

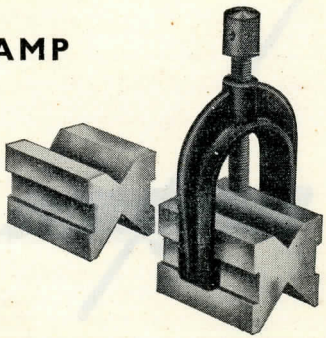
No. **404/9″** Turned Base with 9″ spindle.



This is a specially-designed Surface Gauge to meet the demand for a gauge at a moderate price. It can be used either on flat or round surfaces and has fine adjustment on a rocking pin. The base is of the most suitable weight, and accurate machining ensures rigidity. This gauge is offered as a really reliable article at a moderate price.

No. **406/12″** with 12″ spindle.

# V BLOCKS AND CLAMP



No. **502** These V Blocks and Clamps are for holding circular pieces to be ground, drilled, or milled, etc. The blocks are made of close grained cast iron and are 2″ long × 1½″ square taking work to 1½″ diameter.

The clamp is of drop forged steel made to a robust design.

Packed two Blocks and one Clamp in a case.

Blocks are not sold singly.

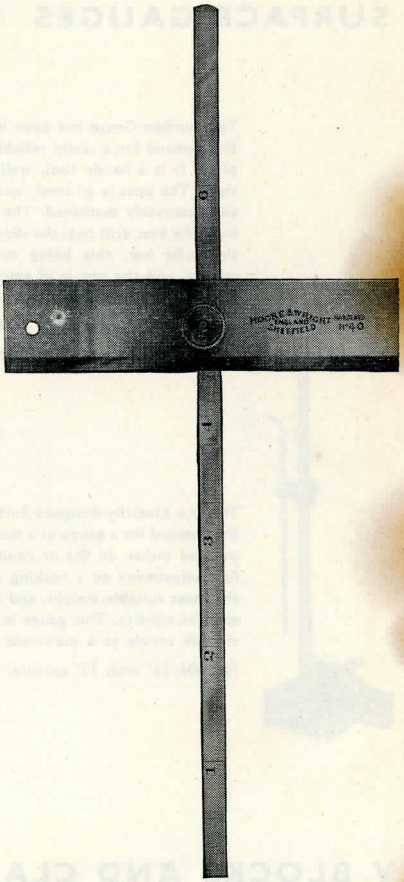
# DEPTH GAUGES

This design of Depth Gauge is supplied in two lengths of base, 3½″ and 6″.

The rule can be used in two positions in the base, the end position allowing for depth measurement to be taken in awkward corners.

The rules are graduated either in 1/64ths and 1/100ths or in mm's and ½ mm's, or in mm's and 1/64ths.

The bases of Nos. 40, 41 and 42 are 5/32″ thick.




No. **40** With 3½″ base and 6″ rule, marked in 1/64ths and millimetres.

No. **40M** As No. 40, but rule in mm. and ½ mm.

No. **40A** Rule marked 1/64ths and 1/100ths.

No. **40C** Rule marked 1/64ths and 1/32nds.

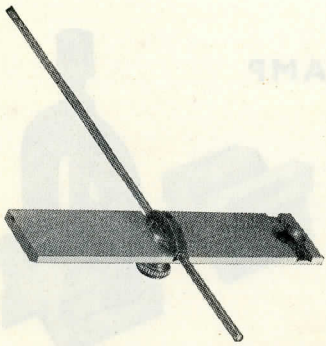
No. **41** 6″ base, 6″ rule, marked 1/64ths and millimetres.

No. **41M** As No. 41, but rule in mm. and ½ mm.

No. **41A** 6″ base, 6″ rule, marked 1/64ths and 1/100ths.

No. **41C** Rule marked 1/64ths and 1/32nds.

No. **42A** With 6″ base and 12″ rule, marked 1/64ths and 1/100ths.



# DEPTH GAUGE ADAPTOR

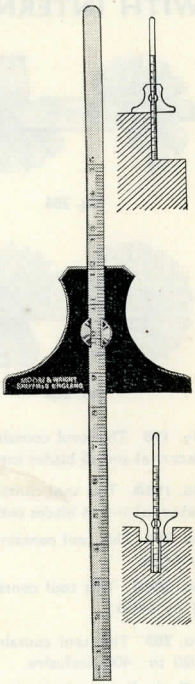
With this device, a round rod (for small holes) can be used in Depth Gauges Nos. 40 to 43.

No. **40R** Attachment complete with rod.

# DEPTH GAUGES

The Depth Gauge illustrated represents our remodelled No. 43. It is fitted with a 6″ narrow steel rule. The body has been increased in thickness, and shortened in length; this will be found an advantage, it now being a much more rigid and substantial tool. The locking nut arrangement is new and is a great improvement.

**The latest improvement is that both faces are now accurately ground in order that the body can be reversed on the rule and used in more confined spaces if necessary.**



The rules are graduated either in 1/64ths and 1/100ths, or in mm's and ½ mm's or in 1/64ths and mm's.

No. **43,** as described and illustrated, with a rule graduated in 1/64ths and mm's.

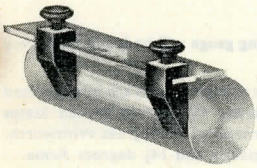
No. **43A,** as above, but with a rule graduated in 1/64ths and 1/100ths.

No. **43B,** with a 12″ rule, graduated in 1/64ths and 1/100ths.

No. **43C,** with rule graduated in 1/64ths and 1/32nds.

No. **43M,** with a 150 mm. rule, graduated in mm's and ½ mm's.

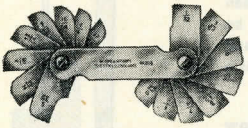
# KEY-SEAT CLAMPS



No. **409** These Key-seat Clamps will transform a rule into a key-seat, or box square. They are a good substitute for a more expensive tool and can be fixed to your rule almost instantly.

The illustration shows their use

# RADIUS GAUGES
## WITH INTERNAL AND EXTERNAL RADII



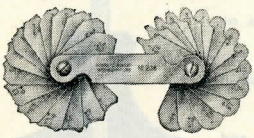
No. **206**

No. **206** This tool contains 16 gauges of radii from $\frac{1}{32}$″ to $\frac{17}{64}$ by 64ths.

No. **206A** This tool contains 16 gauges of radii from $\frac{9}{32}$″ to $\frac{33}{64}$ by 64ths.

No. **207** Contains 20 gauges from ·020 to ·400, inclusive.

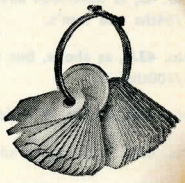
**Each Gauge gives the Internal and External radii.**



No. **208**

No. **208** This tool contains 30 blades, comprising 15 blades **external** and 15 blades **internal** radii from $\frac{1}{32}$″ to $\frac{1}{4}$″ by 64ths.

No. **208A** This tool contains 32 blades, comprising 16 blades **external** and 16 blades **internal** radii from $\frac{17}{64}$″ to $\frac{1}{2}$″ by 64ths.



No. **198**

No. **198** This tool contains 30 blades, comprising 15 blades **external** and 15 blades **internal** radii from $\frac{1}{32}$″ to $\frac{1}{4}$″ by 64ths.

No. **198A** This tool contains 32 blades, comprising 16 blades **external** and 16 blades **internal** radii from $\frac{17}{64}$″ to $\frac{1}{2}$″ by 64ths.

No. **204** This tool contains 16 gauges of radii from $\frac{1}{32}$″ to $\frac{17}{64}$ by 64ths.

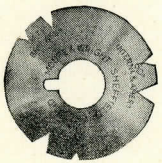
No. **204A** This tool contains 16 gauges of radii from $\frac{9}{32}$″ to $\frac{33}{64}$ by 64ths.

No. **205** This tool contains 20 gauges of decimal radii from ·020 to ·400, inclusive.

**Each Gauge gives the Internal and External radii.**

No. **204**

# SCREW CUTTING GAUGES



No. **200** This screw-cutting gauge will be found to be very useful to the Engineer.

A comprehensive range of angle gauges are incorporated in the one gauge. These are 60 degrees United States Standard and System International, 55 degrees Whitworth, 47½ degrees British Association and 14½ degrees Acme.

No. **203** This is a very useful gauge for checking the angles of various tools after grinding.

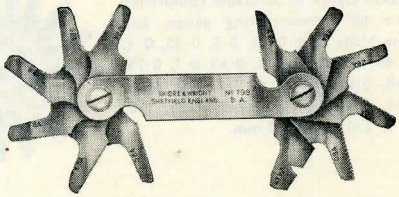
It comprises British Association, Whitworth, System International, and American angles.

# SCREW PITCH GAUGES

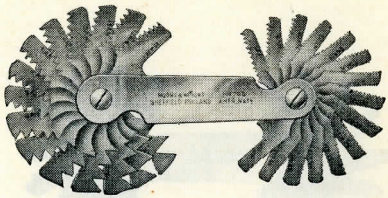
## FOR WHITWORTH, AMERICAN NATIONAL, BRITISH ASSOCIATION AND UNIFIED THREADS

These Gauges are indispensable for the Engineer, and are a worthy addition to any tool kit The blades have been designed to check internal and external threads. They are enclosed in protective steel cases, and are accurately milled by thread ground hobs.

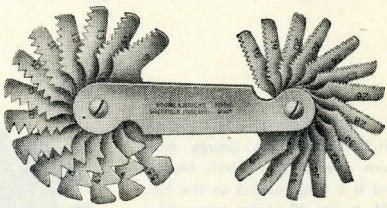
No. **798** (B.A.) Screw Pitch Recognition Gauge of 12 blades comprising one 47½° screw-cutting gauge, and one blade each 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 B.A. Blades.



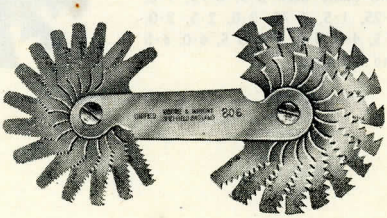
No. **799** (Amern. Natl.) This Screw Pitch Recognition Gauge is suitable for V. and U.S.S. forms of thread. It has 30 blades comprising one blade each 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 T.P.I.



No. **800** (Whit.) Screw Pitch Recognition Gauge of 28 blades comprising one 55° screw-cutting gauge, and one blade each 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 36, 40, 48 and 60 T.P.I. This gauge is suitable for B.S.W. (Whitworth) and B.S.F. ranges of thread, and also for any other range with a basic Whitworth form, e.g. B.S.P. (Gas) Thread. Standard screw diameters are marked on the appropriate blades.



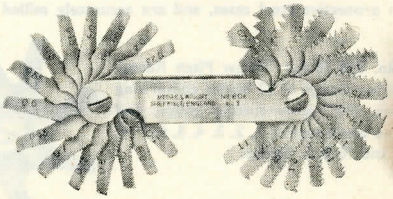
No. **806** Unified Screw Pitch Recognition Gauge, 30 blades comprising, One each 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, T.P.I.

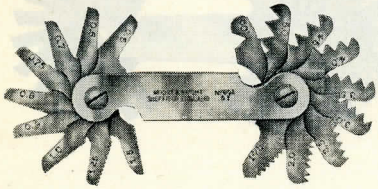


# SCREW PITCH GAUGES

## METRIC THREADS

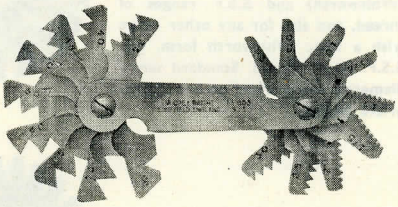
No. **801** (Metric) Screw Pitch Recognition Gauge of 30 blades comprising one 60° screw-cutting gauge, and one blade each 0·25, 0·3, 0·35, 0·4, 0·45, 0·5, 0·55, 0·6, 0·65, 0·7, 0·75, 0·8, 0·85 ,0·9, 1·0, 1·1, 1·2, 1·25, 1·3, 1·4, 1·5, 1·6, 1·7, 1·75, 1·8, 1·9, 2·0, 2·5, 3·0 mm.





No. **802** (Metric) Screw Pitch Recognition Gauge of 18 blades comprising one 60° screw-cutting gauge, and one blade each 0·5, 0·6, 0·7, 0·75, 0·8, 0·9, 1·0, 1·25, 1·5, 1·75, 2·0, 2·5, 3·0, 3·5, 4·0, 4·5, 5·0 mm.

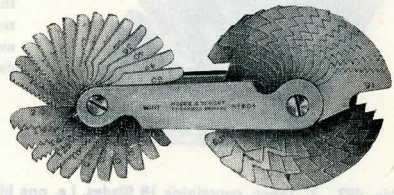
No. **803** (Metric) This Screw Pitch Recognition Gauge contains the coarser pitch blades, and is a complement to the No. 801. It has 18 blades comprising one 60° screw-cutting gauge and one blade each 0·5, 0·75, 1·0, 1·25, 1·5, 1·75, 2·0, 2·5, 3·0, 3·5, 4·0, 4·5, 5·0, 5·5, 6·0, 6·5 and 7.0 mm.



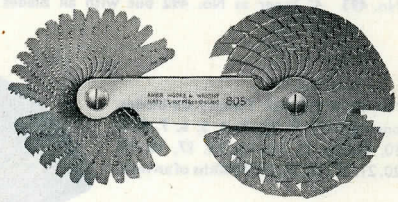
# SCREW PITCH GAUGES

## COMBINING TWO DIFFERENT THREADS IN EACH TOOL

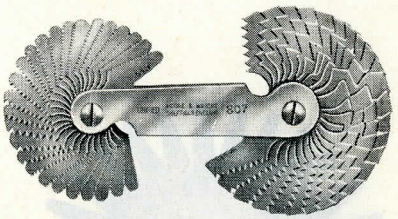
No. **804** Whitworth and Metric Screw Pitch Gauge. **Whitworth side** as No. 800, i.e. comprises one blade each, 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 36, 40, 48 and 60 T.P.I. and one 55° thread-cutting tool gauge. **Metric side,** one blade each 0·4, 0·5, 0·7, 0·75, 0·8, 0·9, 1·0, 1·25, 1·5, 1·75, 2·0, 2·5, 3·0, 3·5, 4·0, 4·5, 5·0, 5·5, 6·0, 6·5 and 7·0 mm. and one 60° thread-cutting tool gauge.



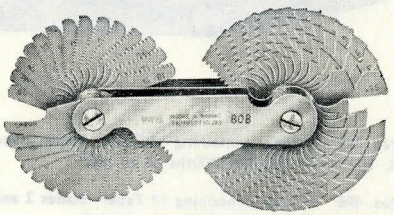
No. **805** American National and Metric Screw Pitch Gauge. **American National side** comprises one blade each 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 and 42 T.P.I. **Metric side,** one blade each 0·4, 0·5, 0·7, 0·75, 0·8, 0·9, 1·0, 1·25, 1·5, 1·75, 2·0, 2·5, 3·0, 3·5, 4·0, 4·5, 5·0, 5·5, 6·0, 6·5, 7·0 mm. and one 60° thread-cutting tool gauge.



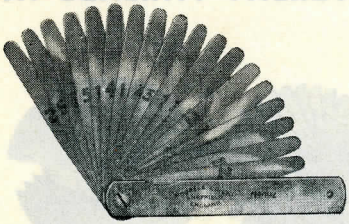

No. **807** Unified and Metric Screw Pitch Gauge. **Unified side** comprises one blade each, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 and 42 T.P.I. **Metric side,** one blade each 0·4, 0·5, 0·7, 0·75, 0·8, 0·9, 1·0, 1·25, 1·5, 1·75, 2·0, 2·5, 3·0, 3·5, 4·0, 4·5, 5·0, 5·5, 6·0, 6·5, 7·0 mm. and One 60° thread-cutting tool gauge.




No. **808** Unified and Whitworth. The Unified section of this Screw Pitch Recognition Gauge comprises 30 Blades. One each 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 and 42 T.P.I. The Whitworth section comprises 28 Blades. One each 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12,13,14,16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 36, 40, 48 and 60 T.P.I. and One 55° Screw Cutting Gauge.



# PRECISION FEELER GAUGES

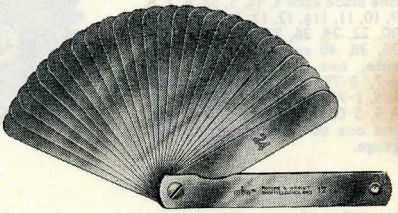


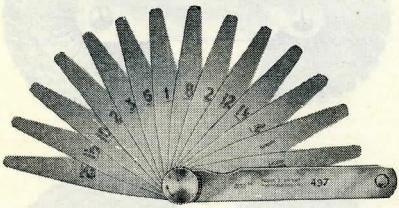
This gauge gives every reading in half-thousandths from 1½ to 6/1000, in addition to the usual sizes up to 25/1000. It covers every need from rough, up to the most delicate measurements.

**No. 492** 3″ Taper, containing 18 Blades, i.e. one blade each 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 12, 15, 20, 25/1000ths of an inch, each blade engraved with number. As illustration.

**No. 493** 4″ Taper as No. 492 but with all Blades 4″ in length.

**No. 12** 3″ Parallel. Twenty-six blades, one each 1½, 2, 2½, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25/1000ths of an inch.





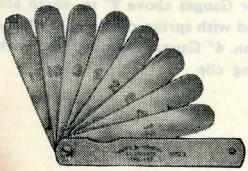
These new Feeler Gauges are designed to give EXTRA SERVICE to the Precision Engineer and others who are engaged in the most exacting types of work. The addition of two new 0·001″ Blades and the fitting of extra 0·0015″ and 0·0002″ Blades increase the measuring range and ensure greater accuracy.

A lockscrew is fitted to these Gauges and it will be found that by loosening it slightly even the thinnest blade can be selected and positioned quickly.

**No. 497** 3″ long, containing 14 Taper Blades 2 each, 1, 1½, and 2/1000ths, 1 each 3, 4, 6, 8, 10, 12, 15 and 25/1000ths of an inch.

**No. 498** 4″ long, containing 14 Taper Blades 2 each, 1, 1½, and 2/1000ths, 1 each 3, 4, 6, 8, 10, 12, 15 and 25/1000ths of an inch.

# PRECISION FEELER GAUGES



No. **22** 3″ Parallel. Eight blades, one each 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch, each marked with size, folding into steel case, as illustration.

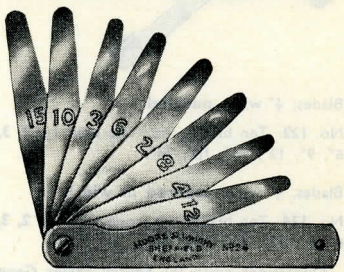
No. **122** 3″ Parallel. Ten blades, one each 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch.

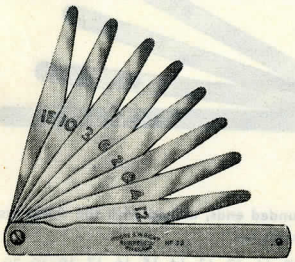
No. **24** 3″ Taper. Eight blades, sizes as No. 22, but tapered as illustration.

No. **124** 3″ Taper. Ten blades, one each 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch.

No. **125** 3″ Taper. Ten blades, one each 1½, 2, 3, 4, 5, 6, 7, 8, 9, 10/1000ths of an inch.

No. **129** 3″ Taper. Nine blades, one each 1½, 2, 3, 4, 6, 8, 10, 12, 15/1000ths.



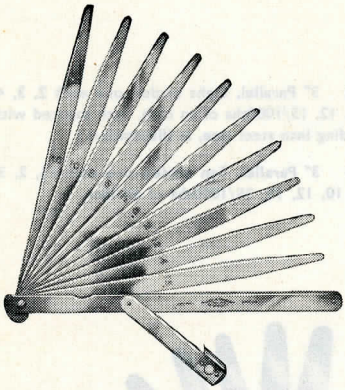


No. **32** 4″ Taper. Eight blades, as illustrated, one blade each 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch.

No. **132** 4″ Taper. Ten blades, one each 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch, with size on each blade, in steel case.

No. **135** 4″ Taper. Ten blades, one each 1½, 2, 3, 4, 5, 6, 7, 8, 9, 10/1000ths of an inch, in steel case.

# PRECISION FEELER STRIP



All Feeler Gauges above 9″ in length are now fitted with spring clip to hold blades in position. 6″ Gauges are not fitted with this spring clip.

Blades, ½″ wide, **parallel.**

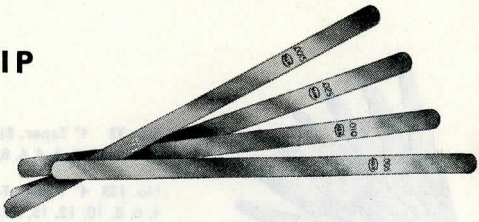
No. **122** Ten blades, viz.: one each 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths. Blade lengths 6″, 9″, 12″, 15″, 18″, 24″.

Blades, ½″ wide, **tapered in width.**

No. **124** Ten blades, viz.: one each 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths. Blade lengths 6″, 9″, 12″, 15″, 18″, 24″.

Quotations given for Special Feeler Gauges on application.

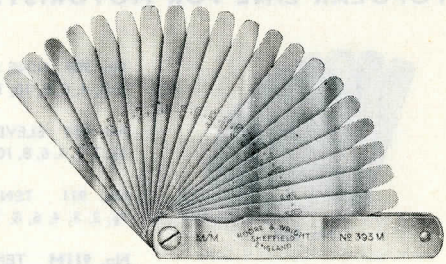
# FEELER STRIP



This strip is supplied in 12″ lengths ½″ wide with rounded ends, etched with the thickness size 2″ from one end. Supplied in the following sizes :—

No. **126** 1, 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 25/1000ths and ·03, ·04, ·05, ·06, ·07, ·08, ·09, ·10, ·15, ·20, ·25, ·30, ·35, ·40, ·45, ·50, ·55, ·60, ·65, ·70, ·75, ·80, ·85, ·90, ·95 and 1·00 millimetres. Other thicknesses in English measure and in Metric will be quoted on request, subject to the availability of material. These sizes will not be etched.

# PRECISION METRIC FEELER GAUGES




No. **389M** containing 13 Blades, 100 mm. long, tapered 5, 10, 15, 20, 25, 30, 40, 50, 60 70, 80, 90 and 100/100ths mm.

No. **390M** containing 20 Blades, 100 mm. long, tapered, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95 and 100/100ths mm.

No. **393M**

No. **391M** containing 10 Blades, 75 mm. long, tapered, 5, 10, 15, 20, 30, 40, 50, 60, 70 and 80/100ths mm.

No. **393M** containing 20 Blades, 75 mm. long, tapered, sizes of blades as No. 390M.

No. **394M** containing 13 Blades, 150 mm. long, tapered, sizes of blades as No. 389M.

No. **395M** containing 20 Blades, 150 mm. long, tapered, sizes of blades as No. 390M.

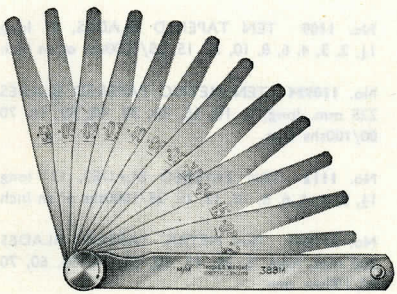
No. **396M** containing 13 Blades, 225 mm. long, tapered, sizes of blades as No. 389M.

No. **397M** containing 20 Blades, 225 mm. long, tapered, sizes of blades as No. 390M.

No. **398M** containing 13 Blades, 300 mm. long, tapered, sizes of blades as No. 389M.

No. **399M** containing 20 Blades, 300 mm. long, tapered, sizes of blades as No. 390M.

No. **387M** 75 mm. long containing 13 blades, 1 each, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40 and 50/100ths mm. 13 blades, 1 each, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 40 and 50/100ths mm.



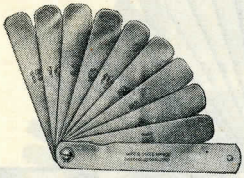

No. **388M**

No. **388M** as **387M** but blades 100 mm. long.

A lockscrew is fitted to No. **387M** and **388M** and it will be found that by loosening it slightly even the thinnest blade can be selected and positioned quickly.

# "SAFE AND SURE" FEELER GAUGES

## POPULAR LINE FOR MOTORISTS



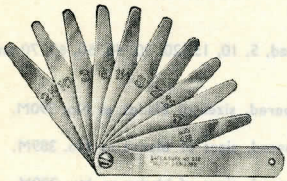
No. **909**

No. **909** NINE PARALLEL BLADES, 3" long, 1½, 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch.

No **910** ELEVEN TAPERED BLADES, 4" long, 1½, 2, 3, 4, 6, 8, 10, 12, 13, 15, 25/1000ths of an inch.

No. **911** TEN TAPERED BLADES, 4" long. 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch.

No. **911M** TEN METRIC TAPERED BLADES, 100 mm. long, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80/100ths mm.



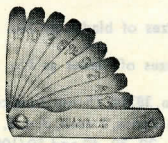
No. **912**

No. **912** TEN TAPERED BLADES, 3" long, 1½, 2, 3, 4, 6, 8, 10, 12 15 25/1000ths of an inch.

No. **912M** TEN METRIC TAPERED BLADES. 75 mm. long, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80/100ths mm.

No. **918T** NINE TAPERED BLADES, 2¼" long, 1½, 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch.

No. **918M** EIGHT METRIC TAPERED BLADES, 57 mm. long, 5, 10, 15, 20, 30, 40, 50, 60/100ths mm.



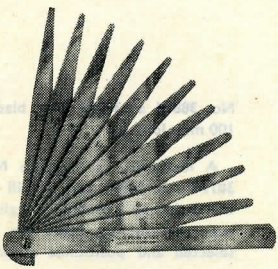
No. **918T**

No. **1106** TEN TAPERED BLADES, 6" long, 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch

No. **1106M** TEN METRIC TAPERED BLADES, 150 mm. long, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80/100ths mm.

No. **1109** TEN TAPERED BLADES, 9" long, 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch

No. **1109M** TEN METRIC TAPERED BLADES, 225 mm. long, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80/100ths mm.



No. **1106**

No. **1112** TEN TAPERED BLADES, 12" long, 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch.

No. **1112M** TEN METRIC TAPERED BLADES, 300 mm. long, 5, 10, 15, 20, 30, 40, 50, 60, 70, 80/100ths mm.

# MOTOR GAUGE

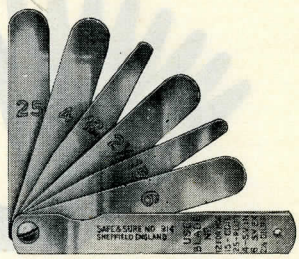
## A POPULAR LINE FOR MOTOR CYCLES

No. **914** This Gauge contains 6 blades, as follows :—

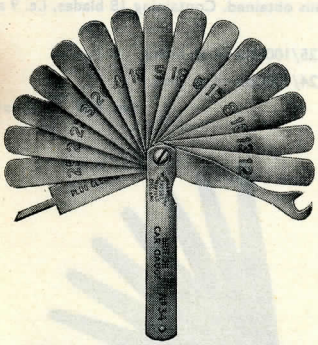
3″ long.
No. 12 for Magneto contact breaker.
No. 4 for Side Valve Inlet.
No. 6 for Side Valve Exhaust.
No. 25 for Plugs.
No. 2½ for Overhead Valve Tappets.
No. 15 for Coil.

The above is indelibly stamped on each Gauge.

For Contact breaker coil ignition use Nos. 12 and 4 together.




# BRITISH CAR GAUGE



No. **34** Contains Gauges for all the settings on all British cars, tappets, magneto or distributor points, and spark plugs. A plug cleaner and magneto spanner are also included in the set. In the few cases where there is no blade of the thickness required, two blades can be used together to obtain the necessary thickness.

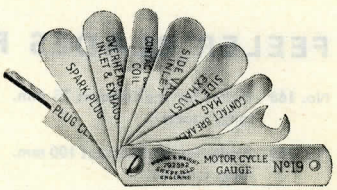
This Gauge contains one 3″ blade each 2, 3 4, 5, 6, 8, 10, 12, 13, 15, 18, 19, 20, 22, 25 thousandths, plug cleaner and magneto spanner

Ideal for the garage and repair man.

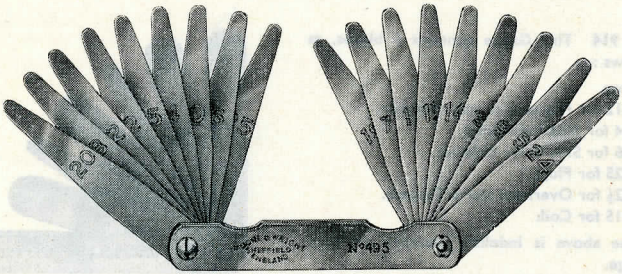
# BRITISH CYCLE GAUGE

No. **19** As illustrated contains one blade each 2¼″ long. This Gauge contains gauges for correctly setting—

Spark Gap, 25.
Contact Breaker, Coil, 15.
Contact Breaker, Mag., 12.
Inlet Valves on Side Valve Engines, 4.
Exhaust Valves on Side Valve Engines, 6.
Inlet and Exhaust on Overhead Valve Engines. 2½.
Plug cleaner and magneto spanner.



# THE "FEELIMIT" GAUGE




The arrangement of the blades in this gauge doubles the usefulness of feeler gauges. The blades at one end can be used as the "high" limit, and those at the other end as "low". Motor mechanics will find it especially useful as it abolishes guess work. By using one gauge at each end definite tolerances can be worked to:—say a valve tappet is being set to 6/1000ths, draw out No. 6 blade at one end and No. 7 at the other, using No. 6 as "GO" and No. 7 as "NOT GO". Perfect exactitude of setting is thus obtained. Containing 18 blades, i.e. 9 at each end.

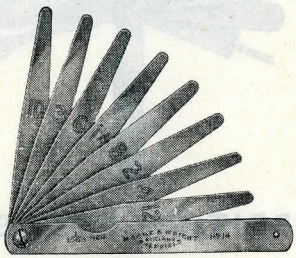
One end 2, 4, 6, 8, 10, 12, 15, 20, 25/1000ths of an inch.

Other end 1½, 3, 5, 7, 9, 11, 14, 19, 24/1000ths of an inch.

No. **495** 3″ Taper, as illustrated. No. **496** 4″ Taper

# VEST POCKET FEELER GAUGE

No. **14** 3″ Taper. Eight blades, one each 1½, 2, 3, 4, 6, 8, 10, 12, in special light case or vest pocket. A very useful gauge.



# FEELER BLADES FOR REPLACEMENT

No. **168** Blades for replacement 75 mm. long, tapered.

No. **169** Blades for replacement 100 mm. long, tapered.

No. **170** **Bolts and Nuts** for Feeler Case

No. **171** 3″ parallel blades, Precision Quality.

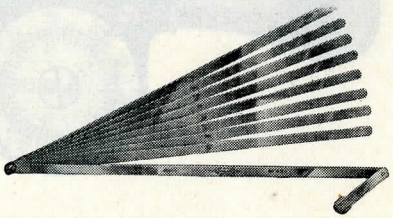
No. **172** 3″ taper blades, Precision Quality.

No. **173** 4″ taper blades, Precision Quality.

# PISTON FITTING FEELER GAUGE

## FOR USE WITH HONING AND GRINDING OUTFITS

A Spring Blade Clip is fitted to each Case to hold blades in position during use.



This FEELER GAUGE is used in connection with re-grinding and re-honing Motor Car Cylinders. As a general guide the limit to be allowed between the size of the Piston and the bore of the Cylinder is :—

For Aluminium Pistons, up to 3″ dia., $1\frac{1}{2}$/1000″ per inch of dia.

For „ „ over 3″ dia., $1\frac{3}{4}$/1000″ „ „

For Cast Iron Pistons, for all sizes, 1/1000″ per inch of dia.

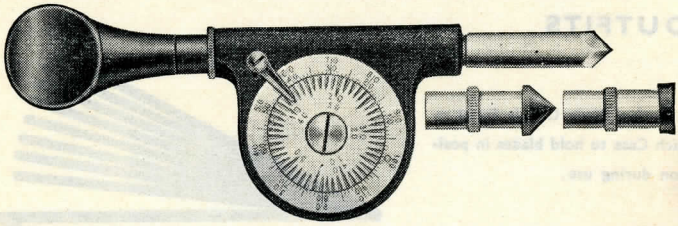
For example, a 3″ Cylinder would have an allowance of ·0045″. The Feeler Blade marked $4\frac{1}{2}$ when put down the side of the Cylinder should be just enough to hold the Piston in position When the Feeler Blade is drawn out, the Piston should just slide down. Where an odd $\frac{1}{4}$/1000″ enters into calculation, it can be ignored.

It must be understood that the above limits vary with the alloy used in the manufacture of the pistons. This is due to the varying expansion of different alloys. In the case of split-skirt pistons the clearance recommended is half the above limits.

The Feeler Gauge contains blades to obtain thicknesses of every half-thousandth, from ·0015″ to ·005″. If larger sizes are required two blades can be used together.

No. **499** Containing eight blades, 10″ by $\frac{1}{4}$″ one blade each, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5/1000ths of an inch in Steel Case.

# SPEED INDICATORS



No. **360** This instrument registers the number of revolutions, over a timed period, of all forms of shafting on or to do with machinery generally. On many occasions the rotative speed of a machine, part of a machine, electric motor or a shaft, etc., must be known so that it can be used efficiently and economically.

No. **360** Speed Indicator will register 5,000 revolutions by one complete turn of the inner dial but by means of simple addition any number of revolutions can be determined. The instrument automatically registers in units, tens and hundreds, the large dial being graduated into one hundred lines (marked in tens), each one indicating one revolution of the spindle or worm. The centre dial has 50 graduations, each indicating one hundred revolutions of the worm (or one complete turn of the large dial). A trip spring attached to the body engages with the deeply recessed graduations on the small dial, holding it from revolving until the large dial makes a complete turn, when a trip pin secured at the zero position passes under the trip spring, lifting it and allowing the small dial to be frictionally moved forward one line by the large dial. The trip spring returns to the next deep graduation, indicating that 100 revolutions have been moved.

The thread ground worm is made of one-piece tool steel and is hardened and tempered; the worm wheel is hobbed, and both worm and worm wheel run in steel bushes. The dials are Pearl chrome plated, ensuring no eye strain, and revolutions can be read in both directions. The black plastic handle is shaped for the easiest and most comfortable grip, and is a safe insulator when used on electric motors or machinery.

Two extra rubber-tipped sleeves are also supplied which, when in use, are placed on the pointed spindle or worm. Their use is advised when determining high speeds and when the part, the revolutions of which are being measured, must not be marked by the pointed worm.

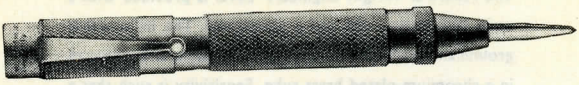
# SPRING DOTTING PUNCH

**No. 279** This handy little punch is for use on small marking jobs where care and accuracy is essential. The body is pearl chrome plated to prevent rust, and the finger grip to which the high quality hardened and tempered spring is attached has been specially shaped for ease in use.

The tool is complete with a pocket clip and a small metal guard for the punch point so that it does not damage the pocket, at the same time the pocket clip prevents the tool from rolling from the bench to the floor.

All working parts are hardened, and the whole tool has been accurately manufactured with our usual attention to detail.

# ADJUSTABLE AUTOMATIC CENTRE PUNCHES



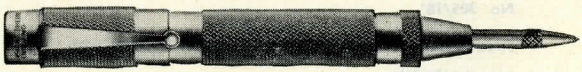
**No. 280** The mechanism of this Automatic Centre Punch is enclosed in a knurled, pearl chrome plated body, and all wearing parts are hardened and tempered and are made of a high grade cast steel. The springs are evenly tempered and guaranteed to give long service

The depth of impression is adjusted by means of the knurled thimble, the approximate weight of impact being 23 lbs. and the minimum 10 lbs.

The adjusting thimble and the punch itself have been so designed to make it impossible for them to be inadvertently removed and lost.

All parts are interchangeable and easily replaced should the occasion arise. The punches can be supplied with a special mark, number, or letter on the end instead of a point. An automatic centre punch so fitted is an ideal method for an inspector to place his mark on work.

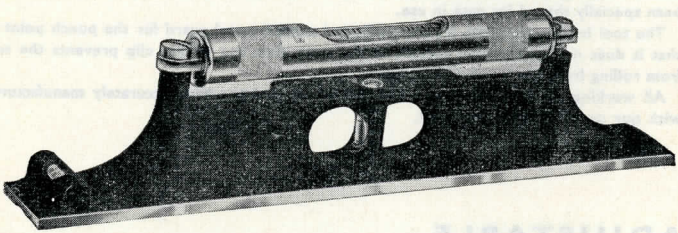
A pocket clip is supplied with this tool, which at the same time prevents it from rolling from the bench.



**No. 281** This tool is similar to the No. 280 except for the punch point which, in the case of the No. 281, can be replaced more simply. Instead of the whole of the punch point being removed, the tip only needs replacing.

# ENGINEERS' LEVEL

## WITH GROUND AND GRADUATED MAIN VIAL



No. **305/12″**

The Moore & Wright Engineers' Level is provided with a main vial, a cross vial and a plumb vial. The main vial is ground and graduated in 1/10th inch divisions and is housed in a chromium-plated brass tube. Sensitivity is such that a bubble movement of one division indicates an off-level of 0·0035″ per foot. This tube is surrounded by a protector tube which revolves to protect the vial when not in use. Clear liquid is used in all the vials and will not discolour. The base is made of high grade cast iron, finished in black crackle enamel. It is accurately machined and is provided with a concave groove for use on cylindrical work or shafting. When the level is used on round work it is possible, by using the cross vial, to check any tendency to cant.

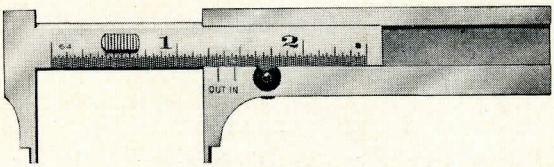
No. **305/18″**

Specifications as above but the 18″ model is fitted with two plumb vials.

Supplied in extremely well made wooden cases.

# POCKET SLIDE CALLIPERS

## ENGLISH, METRIC OR ENGLISH AND METRIC MEASUREMENTS COMBINED




Cat. No. **720A**

No. **720A** English measurements.
No. **720AM** Metric measurements.
No. **720AME** English and metric measurements.

The 3″ (M&W) Pocket Slide Calliper is a very handy tool permitting quick, accurate outside and inside measurements to be taken. The improved clamping device, is a valuable feature as it may be locked by the thumb of the same hand in which the tool is held. A knurled thumb grip is situated on the slide, simplifying the opening and closing of the jaws. Accurate readings are assured since measurements are obtained directly from two lines on the stock marked "in" and "out" for either inside and outside measurements. The slide has a stop preventing it from being entirely withdrawn. Available with English measurements, Metric measurements or with English and Metric measurements combined. Supplied in a black morocco leather case.

| CAT. No. | SIZE | RANGE | | DEPTH OF JAWS | WIDTH OF NIBS CLOSED | GRADUATIONS | |
|---|---|---|---|---|---|---|---|
| | | OUTSIDE | INSIDE | | | SLIDE | STOCK |
| **720A** | 3″ | 0–2⅛″ | ⅛–2¼″ | 11/16″ | ⅛″ | 64ths | 32nds |
| **720AM** | 7 cm. | 0–54 mm. | 3–57 mm. | 17·46 mm. | 3 mm. | ½ mm. | mm. |
| **720AME** | 3″ or 7 cm. | 0–2⅛″ or 0–54 mm. | ⅛–2¼″ or 3–57 mm. | 11/16″ or 17·46 mm. | 3 mm. | 64ths & ½ mm. | 32nds |

# POCKET SLIDE CALLIPERS

## ENGLISH, METRIC OR ENGLISH AND METRIC MEASUREMENTS COMBINED



Cat. No. 728A



No. 728A English measurements.
No. 728AM Metric measurements.
No. 728AME English and metric measurements.

The 3" (76.2 mm) Pocket Slide Caliper is a very handy tool permitting quick, accurate outside and inside measurements to be taken. The improved clamping device, is a reliable feature as it may be locked by the thumb of the same hand in which the tool is held. A knurled thumb grip is situated on the slide, simplifying the opening and closing of the jaws. Accurate readings are obtained since measurements are obtained directly from the line on the steel marked "in." and "mm" for either inside and outside measurements. The slide has a tube extending it does being actually reinforcing. Available with English measurements, Metric measurements or with English and Metric measurements combined. Supplied in a black morocco leather case.

| CAT No. | SIZE | RANGE | | DEPTH OF JAWS | WIDTH OF JAWS CLOSED | GRADUATIONS | |
|---|---|---|---|---|---|---|---|
| | | OUTSIDE | INSIDE | | | SLIDE | STOCK |
| 728A | 3" | 0–3" | 1"–3" | 1" | 1" | 64ths | 32nds |
| 728AM | 7 cm. | 0–84 mm. | 30–70 mm. | 17 mm. | 3 mm. | 1 mm. | mm. |
| 728AME | 3" or 7 cm. | 0–3" or 0–84 mm. | 1"–3" or 30–70 mm. | 1" or 17 mm. | 3 mm. | 64ths & 1 mm. | 32nds |

# ENGINEERS' HAND TOOLS SECTION

SEE PAGE 95 FOR INDEX

FOR COMPLETE NUMERICAL INDEX
SEE PAGES 137/138

## IMPORTANT NOTICE

**ALL TOOLS IN THIS SECTION ARE MADE TO BRITISH STANDARD SPECIFICATION WHERE SUCH EXISTS**

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**FOR PRECISION TOOLS SEE INDEX ON PAGE 13**

# TOOLMAKERS' CABINETS

No. **1007** as illustrated, is comprised of 4 small and 3 large drawers, and is supplied complete with 2 Keys.

11¼" high.
17" long.
8½" back to front.

No. **1008** is comprised of 4 small, 1 medium and 3 large drawers, and is supplied complete with 2 keys.

13½" high.
20" long.
9" back to front.

These two types of cases are robustly constructed of ⅝" hardwood with Yale locks and leather carrying handles, which lie flat when not in use.

They are beautifully finished in a mid oak colour and polished, with oxidised metal corners,

The drawers are extremely well fitted and lined with green baize, and the leather handles and knobs are securely fastened by bolts and nuts.

The detachable fronts are designed for use as sketch boards.

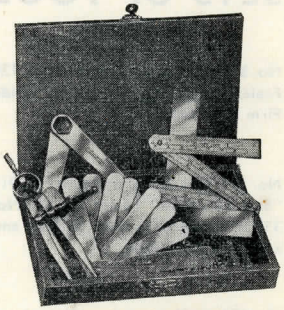
All locks differ on each Cabinet and the drawers accommodate all the usual Toolmakers' equipment such as Surface Gauge, Protractor, Combination Set, Micrometers, Callipers Rules, Clamps, etc.

# SETS OF TOOLS

## MAKE EXCELLENT PRESENTS

**No. 930 This Set contains**

- 1 Outside Calliper Firm Joint, No. **331,** 4 in.
- 1 Pair Spring Dividers, No. **50,** 3 in.
- 1 Precision Feeler Gauge No. **22,** Eight blades from ·002 to ·015
- 1 Precision Try Square, No. **400,** 3 in.
- 1 Rule, 3 fold, 9 in.
- 1 Box with Hinged Lid.



**Cat. No. 930**

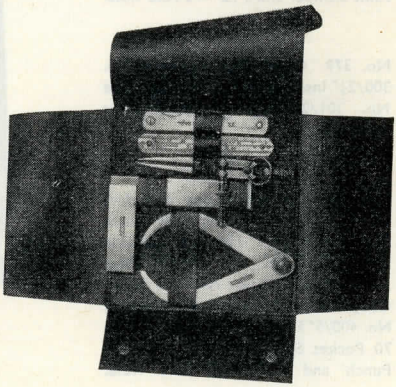
**These Sets of Tools are supplied in wooden cases. If preferred in black, plastic lined wallets, as illustrated below, please add letter "W" to number when ordering, e.g. No. 930W.**

**No. 931 This Set contains**

- 1 Precision Feeler Gauge, No. **22,** with 8 blades from ·002 to ·015.
- 1 Centre Punch, No. **81C.**
- 1 Outside Firm Joint Calliper, No. **331,** 3 in.
- 1 Inside Firm Joint Calliper, No. **330,** 3 in.
- 1 Precision Try Square, No. **400,** 3 in.
- 1 Box with Hinged Lid.

**No. 932 This set contains**

- 1 Outside Firm Joint Calliper, No. **331,** 4 in.
- 1 Inside Firm Joint Calliper, No. **330,** 3 in.
- 1 Centre Punch, No. **81C.**
- 1 Precision Feeler Gauge, No. **22,** Eight blades from ·002 to ·015.
- 1 Box with Hinged Lid.



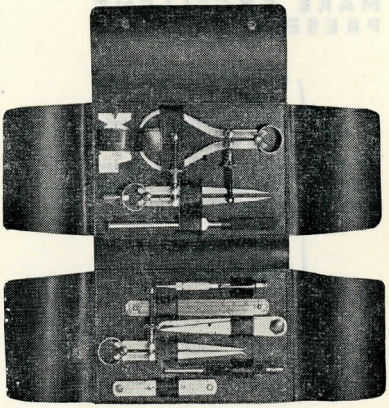
**Cat. No. 930W**

# SETS OF TOOLS

No. **370** Consists of one each No. 129 Feeler Gauge and No. 330/3″ Inside Firm Joint Calliper.

No. **373** Consists of one each No. 911 "Safe and Sure" Feeler Gauge, No. 330/4″ Inside Firm Joint Calliper and a 12″— 3 Fold Rule.

No. **374** As illustrated, consists of one each No. 50/4″ Spring Divider; No. 51/4″ Inside Spring Calliper; No. 52/4″ Outside Spring Calliper; No. 332/4″ Firm Joint Jenny Calliper; No. 24 Feeler Gauge; No. 200 Screw Cutting Gauge; No. 104 Tap Wrench; No. 70 Pocket Scriber; No. 81C Centre Punch and a 12″— 3 Fold Rule.

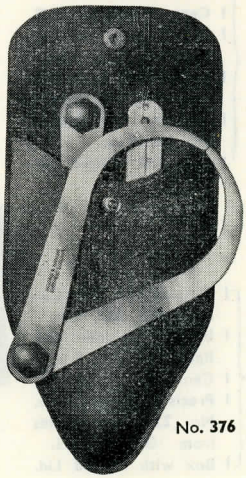


No. **374**

No. **376** As illustrated, consists of one each No. 330/4″ Inside Firm Joint Calliper; No. 331/4″ Outside Firm Joint Calliper and a 12″— 3 Fold Rule.

No. **379** Consists of one each No. 300/2¼″ Inside Firm Joint Calliper and No. 301/2¼″ Outside Firm Joint Calliper.

No. **384** Consists of one each No. 50/4″ Spring Divider; No. 51/4″ Inside Spring Calliper; No. 52 Outside Spring Calliper; No. 336/4″ Firm Joint Jenny Calliper; No. 124 Feeler Gauge; No. 200 Screw Cutting Gauge; No. 400/5″ Engineers' Try Square; No 70 Pocket Scriber; No. 81C Centre Punch and a 12″— 3 Fold Rule.



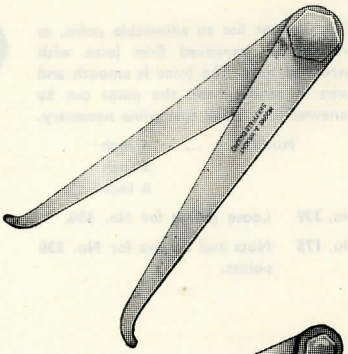
No. **376**

*Any of the above sets containing an English Feeler Gauge can be supplied with a Metric Feeler Gauge as an alternative. Price upon application.*

# FIRM JOINT CALLIPERS AND DIVIDERS

These Callipers are very **Rigid** and the nuts forming the joint are **Accurately machined** and **Hardened,** rendering them smooth and even in tension, and practically doubling the life of the Callipers

**Hexagon Headed Screws on all sizes.** F. J. Callipers will measure approximately one-third greater than their nominal size.

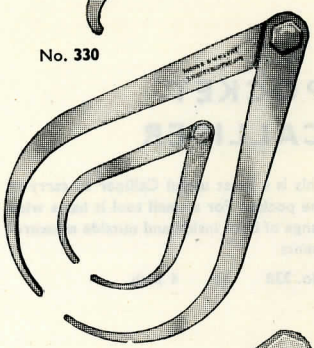


No. **330**

## JOINTS OF STEEL WITH A VELVET FEEL

No **330** Inside
3, 4, 5, 6, 8, 10, 12, 15, 18, 24, 30, 36 inch

No. **331** Outside
3, 4, 5, 6, 8, 10, 12, 15, 18, 24, 30, 36 inch



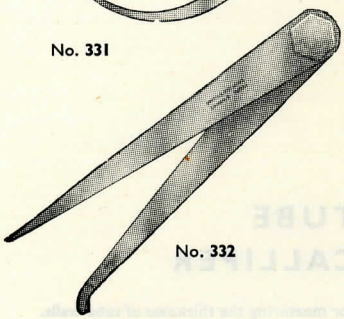
No. **331**

No. **332** Jenny 4, 5, 6 inch

No. **333** Dividers 4, 5, 6, 8, 12 inch (not illustrated)

No. **300** Inside 2¼″ long.

No. **301** Outside 2¼″ long.



No. **332**

## NUTS AND SCREWS FOR FIRM JOINT CALLIPERS

No. **174** 3, 4, 5, 6, 8, 10, 12, 15, 18, 24, 30, 36 inch

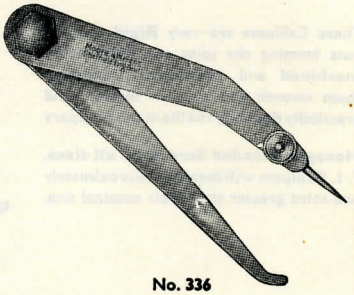
# FIRM JOINT JENNY CALLIPERS

This Calliper has an adjustable point, as well as an improved firm joint with hardened nuts. The joint is smooth and even in tension, and the point can be renewed for a small cost when necessary.

No. **336** ... 4 inch
5 inch
6 inch

No. **339** Loose points for No. 336.

No. **175** Nuts and Screws for No. 336 points.



No. **336**

# POCKET CALLIPER

This is a most useful Calliper to carry in the pocket. For a small tool it has a wide range of both inside and outside measurements.

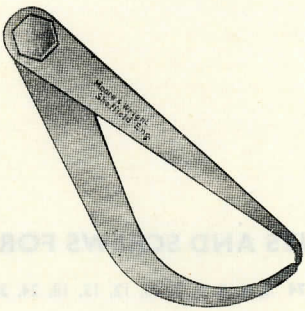
No. **338** 3¼ 4 inch.

No. **338**

# TUBE CALLIPER

For measuring the thickness of tube walls.

No. **344** 3 4 inch
5 6 inch



No. **344**

# NEW FIRM JOINT JENNY CALLIPERS

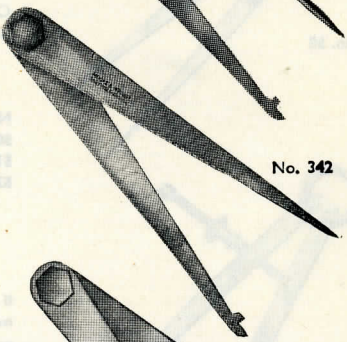
No. **341** The "positive" feature registers a great advance over the old type. All uncertainty when scribing off shoulders completely abolished.

One size only, 5 in.

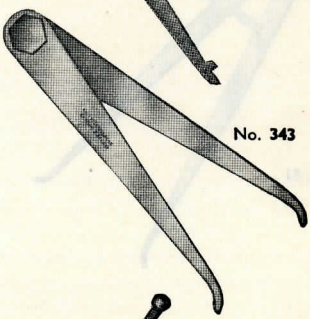
No. 341

No. **342** WITH SOLID POINT
This "positive" feature improves this tool 100 per cent.

One size only, 5 in.



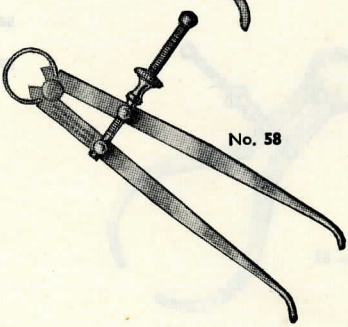
No. 342



No. 343

## GEAR TOOTH CALLIPERS

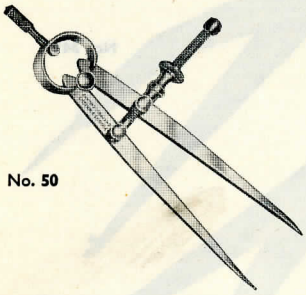
No. **343** Firm Joint type.
3 4 5 6 inch



No. 58

No. **58** Spring type.
3 4 5 6 inch

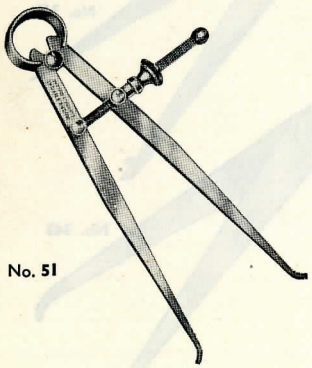
# SHEFFIELD SPRING DIVIDERS AND CALLIPERS
## WITH SOLID AND QUICK NUTS



No. 50

NOTE.—All our Dividers and Callipers are measured from **the joint to the point,** consequently a 3″ measures approximately 4″ overall. Be aware of this when ordering. These Callipers and Dividers measure their nominal size only.

| No. | | Sizes |
|---|---|---|
| **50** Dividers, Solid Nut | | 3, 4, 5, 6, 8, 10, 12 in. |
| **51** Inside Callipers | ,, | |
| **52** Outside Callipers | ,, | |

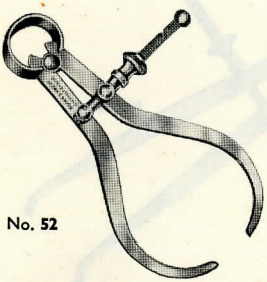


No. 51

If the above are required with a **quick acting nut** in place of the ordinary solid nut please quote the following numbers :

| No. | | Sizes |
|---|---|---|
| **53** Dividers, Quick Nut | | 3, 4, 5, 6, 8, 10, 12 in. |
| **54** Inside Callipers | ,, | |
| **55** Outside Callipers | ,, | |

| | |
|---|---|
| **56** Jenny Callipers, Ordinary Nut | 3, 4, 5, 6, 8, 10 inch |
| **57** Jenny Callipers Quick Nut | 3, 4, 5, 6, 8, 10 inch |

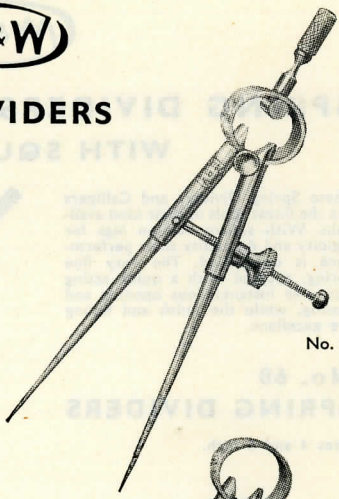


No. 52

**QUICK NUT**

# TOOLMAKERS' DIVIDERS AND CALLIPERS WITH ROUND LEGS

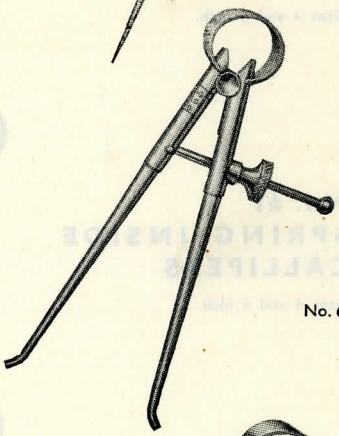
These Spring Dividers and Callipers are made from round section steel and are designed for use by toolmakers. They are accurately finished and may be regarded as fine tools of their kind. The Springs are evenly tempered and the fulcrum stud is hardened.



No. **65**

## No. 65 TOOLMAKERS' DIVIDERS

Sizes 2, 3, 4, 5, and 6 inch.



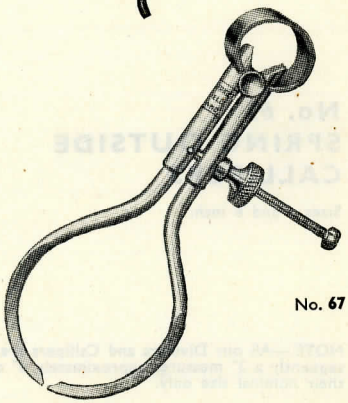
No. **66**

## No. 66 TOOLMAKERS' INSIDE CALLIPERS

Sizes 2, 3, 4, 5, and 6 inch.

## No. 67 TOOLMAKERS' OUTSIDE CALLIPERS

Sizes 2, 3, 4, 5, and 6 inch.

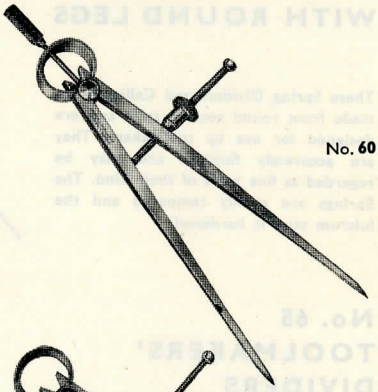


No. **67**

NOTE.—*All our Dividers and Callipers are measured from the joint to the point. Consequently a 3″ measures approximately 4″ overall. These Dividers and Callipers measure their nominal size only.*

# SPRING DIVIDERS AND CALLIPERS
## WITH SQUARE LEGS

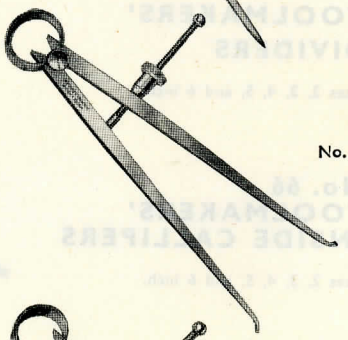
These Spring Dividers and Callipers are the finest tools of their kind available. With square section legs for rigidity and durability their performance is unequalled. The very fine spring, coupled with a quick acting nut, give instantaneous opening and closing, while the finish and fitting are excellent.



No. 60

### No. 60
### SPRING DIVIDERS

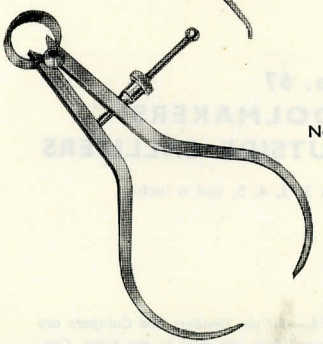
Sizes 4 and 6 inch.



No. 61

### No. 61
### SPRING INSIDE CALLIPERS

Sizes 4 and 6 inch.



No. 62

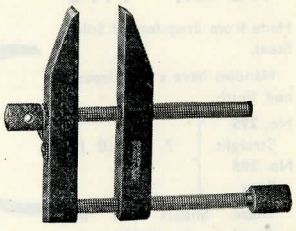
### No. 62
### SPRING OUTSIDE CALLIPERS

Sizes 4 and 6 inch.

NOTE.—All our Dividers and Callipers are measured from the joint to the point. Consequently a 3" measures approximately 4" overall. These Dividers and Callipers measure their nominal size only.

# TOOLMAKERS' CLAMPS

These Clamps are made of steel, case hardened and ground flat on the faces. They are fitted with a device preventing the jaws falling together.

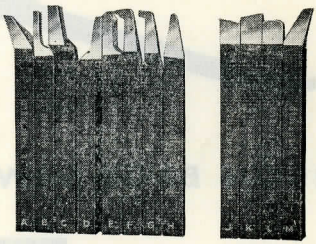


| | Length of Jaws | Size of Jaws | Opening |
|---|---|---|---|
| No. **410** ... ... ... | 2 in. ... ... | $\frac{5}{16}$ in. sq. ... ... | 1 in. |
| No. **411** ... ... ... | 3 in. ... ... | $\frac{7}{16}$ in. sq. ... ... | $1\frac{1}{2}$ in. |
| No. **412** ... ... ... | 4 in. ... ... | $\frac{9}{16}$ in. sq. ... ... | $2\frac{1}{2}$ in. |
| No. **413** ... ... ... | 5 in. ... ... | $\frac{11}{16}$ in. sq. ... ... | $3\frac{1}{2}$ in. |

**N.B —If a "pair" of clamps is ordered, we send TWO clamps.**

Packed one clamp in a box.

# LATHE TOOLS



Sets of any number of Tools of any other shapes can be supplied Sold either in sets of Eight or Twelve, or singly.

All shapes shown are the same price.

Special shapes at special prices.

| CAST STEEL | | | HIGH SPEED STEEL | | |
|---|---|---|---|---|---|
| No. | Square | Length | No. | Square | Length |
| **430** ... | $\frac{1}{4}$ in. ... | 3in. | **440** ... | $\frac{1}{4}$ in. ... | 3 in. |
| **431** ... | $\frac{5}{16}$ in. ... | $3\frac{1}{2}$ in. | **441** ... | $\frac{5}{16}$ in. ... | $3\frac{1}{2}$ in. |
| **432** ... | $\frac{3}{8}$ in ... | 4 in. | **442** ... | $\frac{3}{8}$ in. ... | 4 in. |
| **433** ... | $\frac{7}{16}$ in. ... | $4\frac{1}{2}$ in. | **443** ... | $\frac{7}{16}$ in. ... | $4\frac{1}{2}$ in. |
| **434** ... | $\frac{1}{2}$ in. ... | 5 in. | **444** ... | $\frac{1}{2}$ in. ... | 5 in. |
| **435** ... | $\frac{9}{16}$ in. ... | $5\frac{1}{2}$ in. | **445** ... | $\frac{9}{16}$ in. ... | $5\frac{1}{2}$ in. |
| **436** ... | $\frac{5}{8}$ in. ... | $6\frac{1}{2}$ in. | **446** ... | $\frac{5}{8}$ in. ... | $6\frac{1}{2}$ in. |
| **437** ... | $\frac{3}{4}$ in. ... | $7\frac{1}{2}$ in. | **447** ... | $\frac{3}{4}$ in. ... | $7\frac{1}{2}$ in. |
| **438** ... | 1 in. ... | 9 in. | **448** ... | 1 in. ... | 9 in. |

Larger sizes quoted on application.

## ALL-STEEL TINMAN'S SHEARS

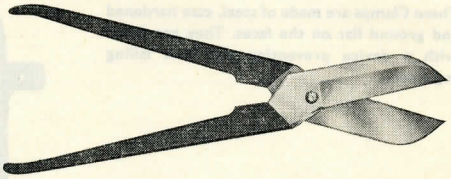
### "NO-NIP" TYPE

Made from drop-forged Solid Steel.

Handles have a Red Japanned finish.

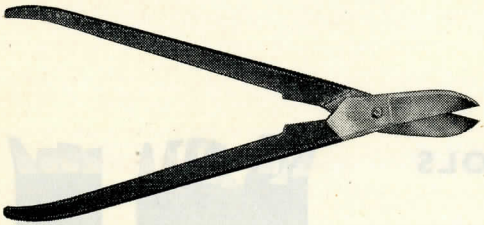
No. **295** Straight
No. **296** Bent
7 8 9 10 12 inch.

These Shears can be ordered in the "NIP" type if required.



## ALL-STEEL JEWELLERS' SHEARS

### "NO-NIP" TYPE



Made from drop-forged Steel.

Handles have a Red Japanned finish.

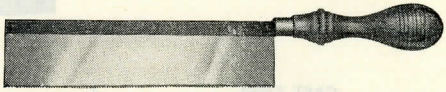
No. **297** Straight 7 inch

No. **282** Bent 7 inch

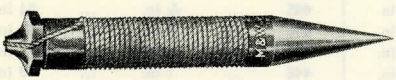
These Shears can be ordered in the "NIP" type if required.

## IRON BACK SAWS

No. **640** 4 5 6 7 8 inch



## STEEL PLUMB-BOBS



These Plumb-Bobs are turned from solid steel, are accurate and will hang perfectly true. They are nicely mottled and have hardened points. The centre portion of the Plumb-Bob is recessed to accommodate the line.

No. **293** Weight 4 oz., length $4\frac{1}{2}$", diameter $\frac{5}{8}$".

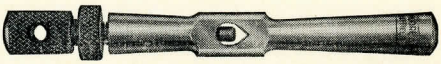
# TOOL AND TAP WRENCHES

No. **102** This tool will hold reamers, taps, drills, etc.

It is nicely knurled and finished. The handles near the ends are recessed to prevent the fingers sliding off during use. Size, $4\frac{1}{2}$ in. long approximately, $\frac{7}{16}$ in. diameter. Capacity 0 to $\frac{1}{4}$ in. diameter.

Fitted with LOCK-NUT to prevent tap working loose during use.

No. **103** This tool is of the same capacity as No. 102 above, and is of superior design and handier to use; lighter, but just as strong.



Length, 4 in. approximately; Diameter $\frac{7}{16}$; Capacity, 0 to $\frac{1}{4}$ in. diameter.

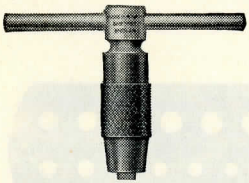
No. **111** As No. 103, but taking up to $\frac{3}{8}$ in. diameter, and is approximately 5 in. long These are fitted with LOCK-NUTS to prevent the tap working loose during use.

No. **104** This wrench is of an improved design, and will hold taps more rigidly than most pattern wrenches now made.

Taps or other tools such as reamers, drills, etc., with either square or round shanks can be held absolutely firm. As shown in the illustration, the taps are gripped **in a V at each side,** thus giving very great holding power. Length, $5\frac{1}{2}$ in. approximately. Capacity, $\frac{1}{8}$ in. to $\frac{5}{16}$ in. taps.

No. **105** Length, $8\frac{3}{8}$ in. approximately; Capacity, $\frac{3}{16}$ to $\frac{5}{8}$ in. taps.

# CHUCK PATTERN TAP WRENCH

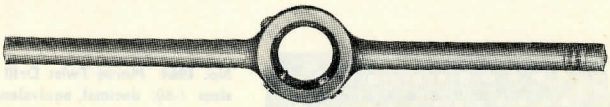


No. **108** Special Small Size for use with small Taps. Capacity $\frac{1}{8}$" taps.

No. **109** Larger type. Capacity $\frac{7}{32}$" taps.

All parts are made of steel and hardened where necessary.

# AMERICAN PATTERN DIE HOLDERS



Forged Steel. Mottled Finish.

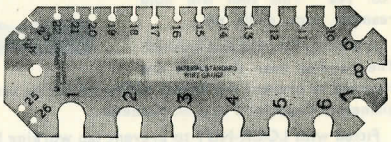
No. **115** Holding $1\frac{3}{16}$ in. dies

NOTE.—Having 3 adjusting screws these Die Holders will hold any type of die.

# WIRE GAUGES

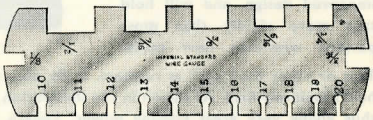
No. **1057** oblong 1 to 26

No. **1058** oblong 1 to 36



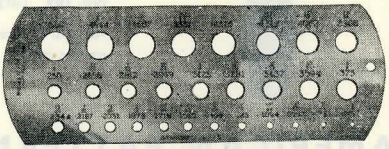
# COMBINED WIRE AND SIZE GAUGE

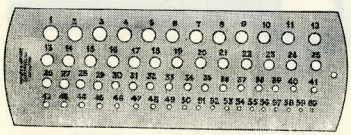
No. **1063** Contains Standard Wire Gauges, 10 to 20, and actual size gauges, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ inch.



# DRILL GAUGES

No. **1059** Jobbers Drill Gauge from $\frac{1}{16}$ to $\frac{1}{2}$ by 64ths.

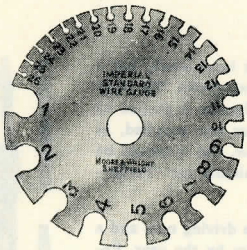




No. **1064** Morse Twist Drill Gauge, for sizes 1-60, decimal equivalent sizes are shown on the reverse side.

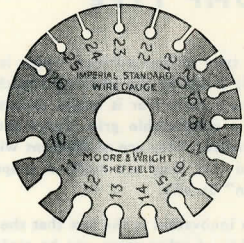
All Gauges are guaranteed accurate, the slots being rectified after hardening.

# IMPERIAL STANDARD WIRE GAUGES




No. **1051** Single Circular 1 to 26.

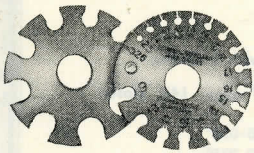
No. **1052** Single Circular 1 to 36.




No. **1050** Single Circular 10 to 26.

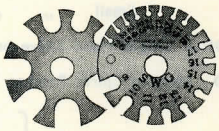
All Gauges are guaranteed accurate, the slots being rectified after hardening.

# DOUBLE CIRCULAR WIRE GAUGES



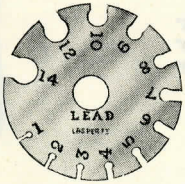
No. **1054** Double Circular 1 to 26.

No. **1055** Double Circular 1 to 36.

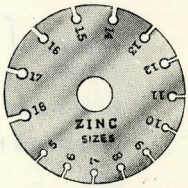


No. **1066** Double Circular Wire Gauge giving sizes 1 to 26.

# ZINC AND LEAD GAUGES

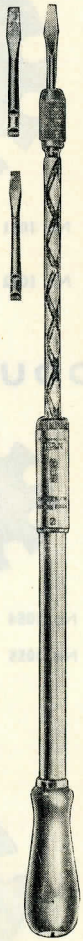



No. **1061** Lead Gauge, 1 to 14 lbs. per foot.




No. **1062** Zinc Gauge, 5 to 18 gauge.

# SPIRAL RATCHET SCREWDRIVERS
## PUMP TYPE



This type of Screwdriver, which is for right and left hand work, has a spring in the handle ensuring a quick return for the next stroke. The body of the Screwdriver is bright chrome-plated, and the handle is shaped to give a comfortable grip. Three interchangeable blades are supplied, as illustrated. They are of different width as shown below, and it should be noted that they are made of a special alloy steel suitable for "Parker-Kalon" Screws.

An innovation is the fact that the manganese bronze driving nuts and a number of other parts, can be replaced when necessary by the user. Replacement instructions are enclosed with each Screwdriver.

**No. 849** Small Spiral Ratchet Screwdriver, 14¼" open, 11" closed.

Separate Blades
- No. **849A** $\frac{5}{32}$" × 0·020"
- No. **849B** $\frac{3}{16}$" × 0·025"
- No. **849C** $\frac{7}{32}$" × 0·030"

Set of 3 Spare Blades, No. **849Z**

Large Driving Nuts, No. **849LN**

Small ,, ,, No. **849SN**

**No. 849RD** (Right Hand Drive only). Complete with 3 Blades.

**No. 850** Medium Spiral Ratchet Screwdriver, 19½" open, 14⅝" closed.

Separate Blades
- No. **850A** $\frac{7}{32}$" × 0·030"
- No. **850B** $\frac{1}{8}$" × 0·035"
- No. **850C** $\frac{9}{32}$" × 0·040"

Set of 3 Spare Blades, No. **850Z**

Large Driving Nuts, No. **850LN**

Small ,, ,, No. **850SN**

**No. 850RD** (Right Hand Drive only). Complete with 3 Blades.

**No. 851** Large Spiral Ratchet Screwdriver, 28⅛" open, 20" closed.

Separate Blades
- No. **851A** $\frac{1}{8}$" × 0·035"
- No. **851B** $\frac{9}{32}$" × 0·040"
- No. **851C** $\frac{5}{16}$" × 0·040"

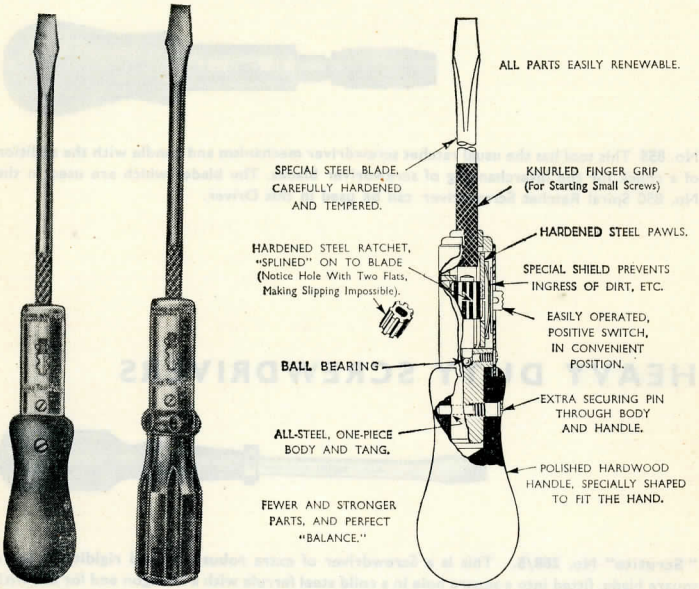
Set of 3 Spare Blades, No. **851Z**

Large Driving Nuts, No. **851LN**

Small ,, ,, No. **851SN**

**No. 851RD** (Right Hand Drive only). Complete with 3 Blades.

# RATCHET SCREWDRIVERS




No. **950** No. **950P**

The Screwdrivers in this range have hardened steel ratchets keyed on the blades. The blades are made of a carefully hardened special alloy steel, and are $\frac{1}{4}$" in diameter with knurled finger grips for starting small screws. The body and tang is in one piece and the polished hardwood handle affords a comfortable grip. All parts are easily renewable.

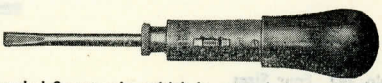
No. **950** ... 2 3 4 5 6 inch blade.

No. **950P** ... 2 3 4 5 6 inch blade.

The No. **950P** Screwdrivers are similar to the range described above with the exception of the Translucent Ruby "Tenite II" handle. This handle is shock-proof, and for all practical purposes unbreakable. All parts are easily renewable.

# LIGHTWEIGHT RATCHET SCREWDRIVERS

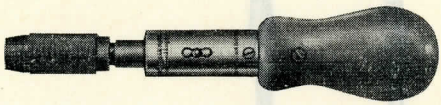
These Screwdrivers are similar to our No. 950 Standard Range, the blades however, being $\frac{3}{16}$" in diameter.



There is also the addition of a flanged, knurled finger grip, which is not only for use when starting small screws but is a necessity when working in awkward positions.

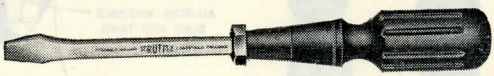
No. **950L** ... 1 2 3 4 inch blade.

## NEW RATCHET DRIVER



No. **855** This tool has the usual ratchet screwdriver mechanism and handle with the addition of a chuck for the interchanging of screwdriver blades. The blades which are used in the No. 850 Spiral Ratchet Screwdriver can be used in this Driver.

## HEAVY DUTY SCREWDRIVERS



**"Scrutite" No. 288/5.** This is a Screwdriver of extra robustness and rigidity. It has a square blade, fitted into a square hole in a solid steel ferrule with a hexagon end for use with a Spanner. The Blade is pinned through the ferrule and butts up against a steel plug at the end. The grooved handle ensures a firm grip. 11 in. overall, 5 in. blade, $\frac{5}{16}$ in. square. Special Alloy STEEL.

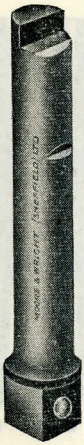
No. **288/11.** As above, but 18½ in. overall, 11 in. blade, $\frac{5}{16}$ in. square.

## KNURLED TURNSCREWS

No. **283** Four Sizes
1½" 2½" 3½" 6"

A very reliable tool, the knurled centre makes it possible to hold small screws very steadily

# WRENCH ADAPTOR AND SOCKETS



No. **850W.A.** This Wrench Adaptor is hardened and tempered and is made to be used with No. **850** Spiral Ratchet Screwdriver and No. **855** Ratchet Driver. We can also supply sockets, to be used with this Adaptor, as shown below.

BRITISH ASSOCIATION SIZES—HEXAGON

| No. | Across Flats | Whit. | B.A. |
|---|---|---|---|
| **MH152** | ·152 | — | 8 |
| **MH172** | ·172 | — | 7 |
| **MH193** | ·193 | — | 6 |
| **MH220** | ·220 | — | 5 |
| **MH248** | ·248 | — | 4 |
| **MH282** | ·282 | — | 3 |
| **MH324** | ·324 | — | 2 |
| **MH338** | ·338 | $\frac{1}{8}$ | — |
| **MH365** | ·365 | — | 1 |
| **MH413** | ·413 | — | 0 |

**"Britool" High Grade Chrome Alloy Steel Sockets are available as shown.**

AMERICAN STANDARD SIZES—HEXAGON

| No. | Across Flats | S.A.E. |
|---|---|---|
| **MH187** | $\frac{3}{16}$ | — |
| **MH219** | $\frac{7}{32}$ | — |
| **MH234** | $\frac{15}{64}$ | — |
| **MH250** | $\frac{1}{4}$ | — |
| **MH266** | $\frac{17}{64}$ | — |
| **MH281** | $\frac{9}{32}$ | — |
| **MH312** | $\frac{5}{16}$ | — |
| **MH344** | $\frac{11}{32}$ | — |
| **MH375** | $\frac{3}{8}$ | $\frac{3}{16}$ |
| **MH437** | $\frac{7}{16}$ | $\frac{1}{4}$ |

BRITISH STANDARD SIZES—BISQUARE

| No. | Across Flats | Whit. |
|---|---|---|
| **MQ250** | $\frac{1}{4}$ | $\frac{1}{8}$ |
| **MQ312** | $\frac{5}{16}$ | $\frac{5}{32}$ |
| **MQ375** | $\frac{3}{8}$ | $\frac{3}{16}$ |

# CAST STEEL CENTRE PUNCHES

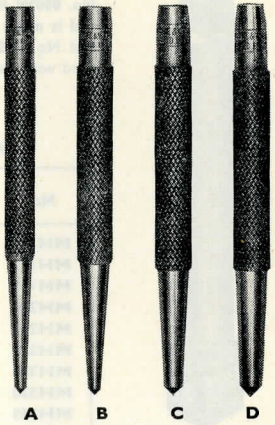
These Punches have knurled finger grips, and are properly heat treated. Long experience has dictated their size and shape, and they are supplied in seven different sizes, as indicated below.

| | | | | |
|---|---|---|---|---|
| No. **81A** | $\frac{1}{8}$″ | at point $\frac{5}{16}$″ | dia. | just under 4″ long |
| No. **81B** | $\frac{5}{32}$″ | ,, $\frac{3}{8}$″ | ,, | ,, 4″ ,, |
| No. **81C** | $\frac{3}{16}$″ | ,, $\frac{3}{8}$″ | ,, | ,, 4″ ,, |
| No. **81D** | $\frac{1}{4}$″ | ,, $\frac{3}{8}$″ | ,, | ,, 4″ ,, |

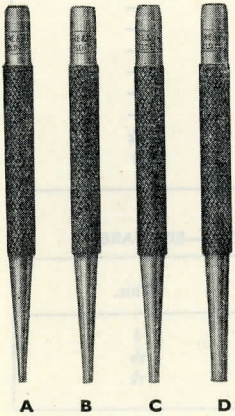
No. **83** 5″ × $\frac{1}{2}$″ Not illustrated

No. **85** 6″ × $\frac{5}{8}$″ ,,

No. **86** 7″ × $\frac{3}{4}$″ ,,




# CAST STEEL NAIL SETS

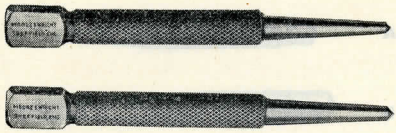



All points are cupped and bevelled and will not splinter in use.

| | | | | |
|---|---|---|---|---|
| No. **82A** | $\frac{1}{16}$″ | at point $\frac{5}{16}$″ | dia. | just under 4″ long. |
| No. **82B** | $\frac{3}{32}$″ | ,, $\frac{5}{16}$″ | ,, | ,, 4″ ,, |
| No. **82C** | $\frac{1}{8}$″ | ,, $\frac{5}{16}$″ | ,, | ,, 4″ ,, |
| No. **82D** | $\frac{5}{32}$″ | ,, $\frac{5}{16}$″ | ,, | ,, 4″ ,, |

No. **82E** $\frac{3}{16}$″ at point, $\frac{3}{8}$″ dia., 4″ long.
No. **82F** $\frac{3}{16}$″ at point, $\frac{3}{8}$″ dia., 5″ long.
} Not illustrated

# SQUARE HEAD CENTRE PUNCHES



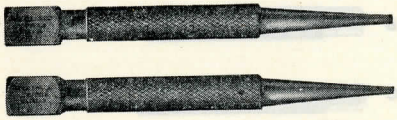

These Punches are made from Special Tool Steel, scientifically hardened and tempered.

The Knurling is clean and well cut and gives a firm grip without chafing the skin.

| | | Point | Body | Head | Length |
|---|---|---|---|---|---|
| No. 351 | A | $\frac{1}{8}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ sqare | 4″ |
| | B | $\frac{5}{32}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |
| | C | $\frac{3}{16}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |
| | D | $\frac{1}{4}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |

No. **351W** Set of 4 Centre Punches in a black, plastic lined wallet.

# SQUARE HEAD NAIL SETS




These Nail Punches are made from Special Tool Steel and will not splinter in use.

The points are cupped and bevelled.

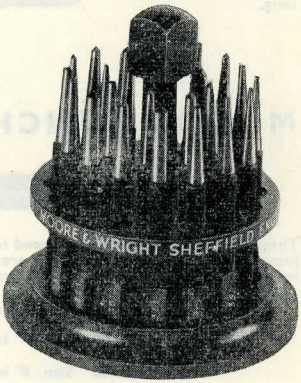
The Knurling is clean and well cut, and gives a firm grip without chafing the skin.

| | | Point | Body | Head | Length |
|---|---|---|---|---|---|
| No. 352 | A | $\frac{1}{16}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ square | 4″ |
| | B | $\frac{3}{32}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |
| | C | $\frac{1}{8}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |
| | D | $\frac{5}{32}$″ | $\frac{11}{32}$″ | $\frac{3}{8}$″ ,, | 4″ |

No. **352W** Set of 4 Nail Punches in a black, plastic lined wallet.

# DISPLAY STAND

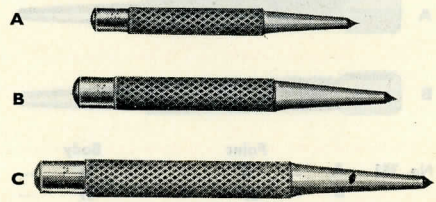
No. **186** This stand contains 2 dozen Square Head Nail Sets and Centre Punches. It is given away free, on request, with orders. 12 dozen assorted.



# MODEL MAKERS' PUNCHES

No. **265** Set of 3 Centre Punches
1 each—

| A | B | C |
|---|---|---|
| $2\frac{1}{4}$″ | $2\frac{3}{8}$″ | $3\frac{3}{8}$″ long |
| $\frac{5}{64}$″ | $\frac{1}{8}$″ | $\frac{9}{64}$″ at point |
| $\frac{3}{16}$″ | $\frac{1}{4}$″ | $\frac{5}{16}$″ dia. |

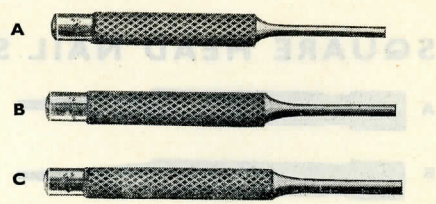



No. **266** Set of 3 Pin Punches
1 each—

| A | B | C |
|---|---|---|
| $2\frac{1}{4}$″ | $2\frac{3}{8}$″ | $2\frac{1}{2}$″ long |
| $\frac{1}{16}$″ | $\frac{5}{64}$″ | $\frac{3}{32}$″ at point |
| $\frac{3}{16}$″ | $\frac{5}{16}$″ | $\frac{7}{16}$″ dia. |

No. **267** Set of 3, larger
Each—

| A | B | C |
|---|---|---|
| $2\frac{3}{4}$″ | $2\frac{7}{8}$″ | 3″ long |
| $\frac{3}{32}$″ | $\frac{7}{64}$″ | $\frac{1}{8}$″ at point |
| $\frac{1}{4}$″ | $\frac{1}{4}$″ | $\frac{1}{4}$″ dia. |




# PRICK PUNCH

No. **79** $\frac{9}{32}$″ diameter, $\frac{3}{32}$″ at point, just under 4″ long.

# MOTOR PUNCHES

These Punches have been introduced to meet the growing demand for a reliable article for knocking out taper pins, etc. They are made of cast steel, are nicely knurled in the middle for a grip, are hardened both ends, and the size will be found very handy.

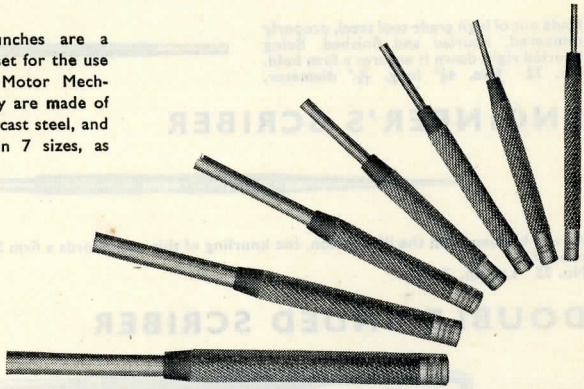
No. **87** Size, 6″ long, $\frac{3}{8}$″ diameter, $\frac{5}{32}$″ at point.

No. **88** Size, 7″ long, $\frac{1}{2}$″ diameter, $\frac{3}{16}$″ at point.

No. **188** Size, 8″ long, $\frac{5}{8}$″ diameter, $\frac{1}{4}$″ at point.

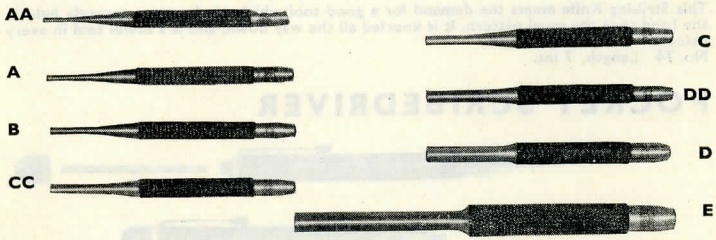
# INSERTED PIN PUNCHES

These Pin Punches are a strong, useful set for the use of Engineers, Motor Mechanics, etc. They are made of a good quality cast steel, and are supplied in 7 sizes, as below.



| No. | Diameter | Protrusion | Body | Length |
|---|---|---|---|---|
| 84A | $\frac{1}{16}$″ | $\frac{3}{4}$″ | $\frac{9}{32}$″ | 4″ |
| 84B | $\frac{3}{32}$″ | 1″ | $\frac{9}{32}$″ | 4″ |
| 84C | $\frac{1}{8}$″ | $1\frac{1}{4}$″ | $\frac{5}{16}$″ | 4″ |
| 84D | $\frac{3}{16}$″ | $1\frac{3}{8}$″ | $\frac{3}{8}$″ | $4\frac{1}{4}$″ |
| 84E | $\frac{1}{4}$″ | 2″ | $\frac{7}{16}$″ | 5″ |
| 84F | $\frac{5}{16}$″ | $2\frac{1}{4}$″ | $\frac{1}{2}$″ | 6″ |
| 84G | $\frac{3}{8}$″ | $2\frac{1}{2}$″ | $\frac{9}{16}$″ | 7″ |

# PARALLEL PIN PUNCHES




No. **161**

| No. | Punch Dia. | Body Dia. | Length |
|---|---|---|---|
| 161AA | $\frac{1}{16}$″ | $\frac{9}{32}$″ | 4″ |
| 161A | $\frac{3}{32}$″ | $\frac{9}{32}$″ | 4″ |
| 161B | $\frac{1}{8}$″ | $\frac{9}{32}$″ | 4″ |
| 161CC | $\frac{5}{32}$″ | $\frac{5}{16}$″ | 4″ |
| 161C | $\frac{3}{16}$″ | $\frac{5}{16}$″ | 4″ |
| 161DD | $\frac{7}{32}$″ | $\frac{3}{8}$″ | 4″ |
| 161D | $\frac{1}{4}$″ | $\frac{3}{8}$″ | 4″ |
| 161E | $\frac{5}{16}$″ | $\frac{1}{2}$″ | 6″ |

Sets No.

**161F** Set of 5 one each A, B, C, D, E.

**161G** ,, 5 ,, AA, A, B, C, D.

**161H** ,, 5 ,, AA, A, B, CC, C.

**161J** ,, 8 ,, AA, A, B, CC, C, DD, D, E.

# MACHINIST'S SCRIBER

Made out of high grade tool steel, properly tempered, knurled and finished. Being knurled right down it ensures a firm hold.
No. **72** Size, 4½″ long, $\frac{3}{16}$″ diameter.

# ENGINEER'S SCRIBER

As will be seen from the illustration, the knurling of this tool affords a firm hold just where needed.
No. **75** Length, 7 ins.

# DOUBLE ENDED SCRIBER

No. **77** A superior article, with detachable points, length 7 ins.

# JOINER'S STRIKING KNIFE

This Striking Knife meets the demand for a good tool which can be more securely held in the hand than the usual pattern. It is knurled all the way down, and is a useful tool in every respect.
No. **74** Length, 7 ins.

# POCKET SCRIBEDRIVER

**No. 71 SCRIBER AND SCREWDRIVER COMBINED.**

This attractive tool has a plastic body with a knurled chuck at one end, and the blades are of good quality carbon steel, properly hardened and tempered.

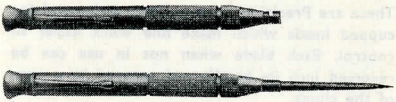
The screwdriver blade has a machined tang which fits positively in the chuck and resists turning.

A pocket clip is provided, and for safe carriage in the pocket one of the blades can be reversed in the chuck and telescoped inside the body; the remaining blade is accommodated at the other end of the body which is drilled out and fitted with a screw cap.

Beautifully finished, the chuck and pocket clip are nickel bright plated.

**No. 70A** Spare blades—Scriber.
**No 76A** „ „ —Screwdriver.

# POCKET SCRIBERS



These tools are of a **new improved design** having bodies with straight knurls, which give the fingers a really good grip.

The Scriber point, which is made from best quality steel and correctly hardened, is held by a knurled chuck. It can also be reversed for easy carriage, and a pocket clip is now provided which also prevents these tools rolling off the bench.

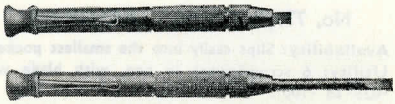
**No. 70** $\frac{9}{32}$" diameter and $3\frac{1}{2}$" long when closed.

**No. 70A** Scribers only.

**No. 700** $\frac{3}{8}$" diameter and $4\frac{3}{8}$" long when closed.

**No. 700A** Blades for 700.

# POCKET SCREWDRIVERS



These are of a **new improved design** as the Pocket Scribers, but with screwdriver blades. The butt of the blade fits a solid lock in the body which prevents it from turning.

**No. 76** $\frac{9}{32}$" diameter and $3\frac{1}{2}$" long, when closed.

**No. 76A** Blades only.

**No. 760** $\frac{3}{8}$" diameter and $4\frac{5}{16}$" long when closed.

**No. 760A** Blades only.

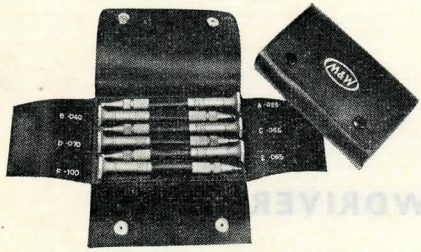
# JEWELLERS' SCREWDRIVERS

PEARL CHROME-PLATED TO PREVENT RUST
These are Precision Screwdrivers with revolving cupped heads which make fine work easier to control. Each blade when not in use can be reversed into its handle and secured by a turn of the chuck.

No. **777A** with ·025 Blade
No. **777B** „ ·040 „
No. **777C** „ ·055 „
No. **777D** „ ·070 „
No. **777E** „ ·085 „
No. **777F** „ ·100 „

Spare blades can be supplied and should be ordered "777A blade or 777B blade, etc."

No. **777/1** The 6 comp'ete screwdrivers are supplied as a set, each in a separate compartment in a wooden case as shown.



No. **777/1W** Set of 6 Jewellers' Screwdrivers can now be supplied in a new black plastic lined wallet as illustrated.

The size of each blade is marked on the side flaps of the wallet, together with the letter denoting each blade size, opposite the appropriate screwdriver.

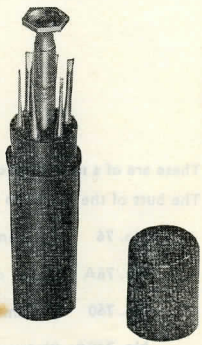
The wallet is very compact and can easily be carried in the pocket.

Spare blades can be supplied

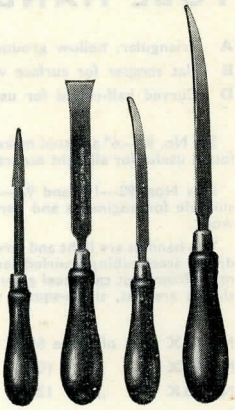
## No. 777/2 "VEST POCKET" SET

**Availability:** Slips easily into the smallest pocket.
**Utility:** 6 screwdrivers in one, with blade widths from ·025" to ·100".
**Ease in use:** Positive chuck holds the blades tightly and rigidly. Revolving hexagon cupped head allows fine work to be controlled more easily. The body, being knurled, allows good finger grip.
**Speed in use:** Each blade is in a separate compartment marked with its own particular letter corresponding to the sizes below. No searching for the correct blade.
**Long Life:** Pearl chromed body and chuck to prevent rust. If placed on the bench the hexagon shaped head prevents it rolling off. Blades being totally enclosed in a strong attractive bakelite case, cannot be easily damaged.

Spare blades can be supplied.



# WOOD HANDLED ENGINEERS' SCRAPERS

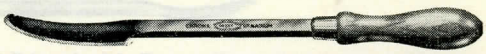


No. **96A** Three-square 4 in. blade
No. **96B** Flat 4 in. blade
No. **96C** Curved 4 in. blade
No. **96D** Curved 5 in. blade
No. **96** Set of Four
No. **97A** Three-square 5½ in. blade
No. **97B** Flat 6 in. blade
No. **97C** Curved 6 in. blade
No. **97D** Curved 8 in. blade
No. **97** Set of Four
No. **98** Set of 4 half-round curved, from 4 to 8 in.
No. **95** Set of 3 { three-square / flat / half-round } 4 in.

**LARGER SCRAPERS**

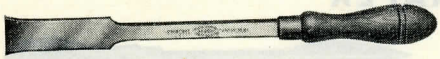
| 8 in. BLADE | 10 in. BLADE | 12 in. BLADE |
|---|---|---|
| No. **99A** Three-square | No. **100A** Three-square | No. **101A** Three-square |
| No. **99B** Flat | No. **100B** Flat | No. **101B** Flat |
| No. **99C** Flat half-round | No. **100C** Flat half-round | No. **101C** Flat half-round |
| No. **97D** Curved half-round | No. **100D** Curved half-round | No **101D** Curved half-round |

# THE "ERECTORS" SCRAPERS



This high quality Scraper embodies all those delicate refinements which are appreciated by the skilled craftsman. The flat section of the shank has the edges rounded and gives an easy grip for the side movement. The Steel used is made in Sheffield, and our guarantee goes with every Tool.

No. **257** 9 in. blade, 5 in. handle, 14 in. overall.



No. **256** Similar quality to No. 257 above, but flat as shown. 8¼ in. blade, 5 in. handle, 13¼ in. overall.

**See Scrapers Dimensions on Page 123**

# TUBE HANDLED SCRAPERS

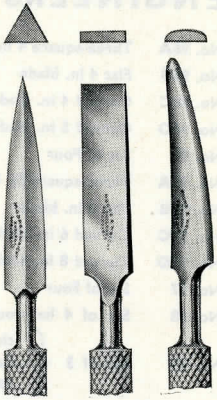
**A** Triangular, hollow ground on sides.
**B** Flat scraper for surface work.
**D** Curved half-round for use in bearings, etc.

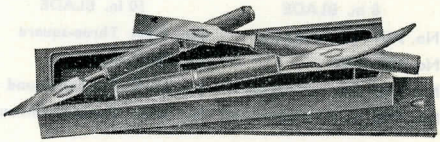
Set No. **91**—6″ are tool makers' scrapers and will be found useful for all light accurate work.

Sets Nos. **92**—10″ and **93**—12″ are larger, and are suitable for engineers and particularly for motor car work.

The handles are light and strong, being made of solid drawn steel tubing knurled for a grip. The blades are made from best cast steel ground after hardening. The shapes are flat, three-square and half-round curved.

No. **91X** Set of three 6″ in wooden box.
No. **92X** „ 10″ „
No. **93X** „ 12″ „



# THE "MOORITE" SCRAPER

These Scrapers are made from a Tungsten Tool Steel specially produced for the purpose of Scrapers where the cutting edge must remain sharp for long periods. **The edge on these tools will remain sharp without grinding for years.**

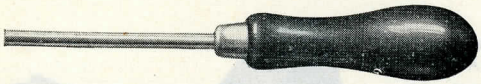
No. **258D** Curved Half-round 4″ 6″ 8″ blade. To order single Tools, i.e. 258D/4″
No. **258D** Set of 3. (4″, 6″ and 8″)

# BEARING SCRAPER

No. **533** Forged out of solid bar, this Scraper has three cutting edges. It is forged hollow, and is easily sharpened.

**See Scrapers Dimensions on Page 123**

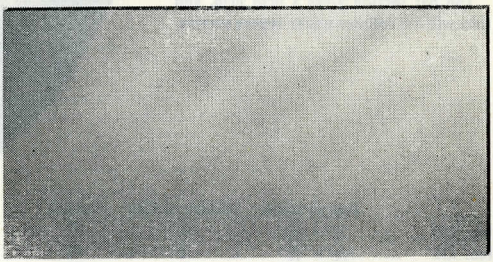
# SCRAPER SHARPENERS



No. **290** Joiners, round blade.

# CABINET SCRAPERS

No. **697**
3″ × 1½″ 5″ × 2½″
4″ × 2″ 6″ × 3″



# CARBON SCRAPER

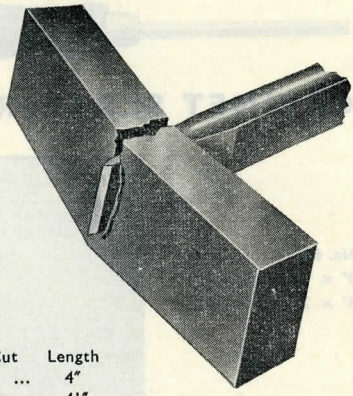
This is a Carbon Scraper designed to be used with a pull-cut.
No. **90** 10 inches long, one size only.

## DIMENSIONS OF SCRAPERS

*The sizes must be taken as approximate as slight variations occur*

| Catalogue Nos. | Overall length | Length of Blade | Length of Cutting Edge | Width of Cutting Edge | Catalogue Nos. | Overall length | Length of Blade | Length of Cutting Edge | Width of Cutting Edge |
|---|---|---|---|---|---|---|---|---|---|
| | inches | inches | inches | inches | | inches | inches | inches | inches |
| **96A** | 8 | 4 | 2¼ | | **101C** | 18 | 12 | — | 1¼ |
| **B** | 8 | 4 | — | 9/16 | **D** | 18½ | 12 | 6 | |
| **C** | 8 | 4 | 1¾ | | **533** | 10¾ | 6¾ | 2¾ | |
| **D** | 9 | 5 | 2 | | **91A** | 7⅜ | 2⅞ | 1⅞ | |
| **97A** | 10 | 5¾ | 3 | | **B** | 7 | 2 9/16 | — | ⅜ |
| **B** | 10¾ | 6¼ | — | 13/16 | **D** | 7⅜ | 2⅞ | 1⅞ | |
| **C** | 10½ | 6 | 3¼ | | **92A** | 9⅜ | 4⅛ | 3 | |
| **D** | 14 | 8¼ | 4¼ | | **B** | 9⅜ | 4⅛ | — | 11/16 |
| **99A** | 13½ | 8¼ | 4¼ | | **D** | 10 | 4½ | 3⅜ | |
| **B** | 13 | 7½ | — | 1 | **93A** | 11¾ | 4¾ | 3⅜ | |
| **C** | 13 | 8 | — | ⅞ | **B** | 11⅜ | 4⅝ | — | 11/16 |
| **100A** | 16 | 10¾ | 5½ | | **D** | 12 | 5 | 3⅞ | |
| **B** | 15½ | 10 | — | 1¼ | **256** | 13¼ | 8¼ | — | 1⅛ |
| **C** | 15¾ | 10¼ | — | 1 | **257** | 14 | 9 | 4¼ | |
| **D** | 15½ | 10½ | 5½ | | **258D** 4″ | 7¼ | 4 | 1½ | |
| **101A** | 17½ | 12 | 6 | | 6″ | 9½ | 6 | 2 | |
| **B** | 17¼ | 11½ | — | 1⅜ | 8″ | 11½ | 8 | 2¼ | |

# SURE-CUT CHISELS



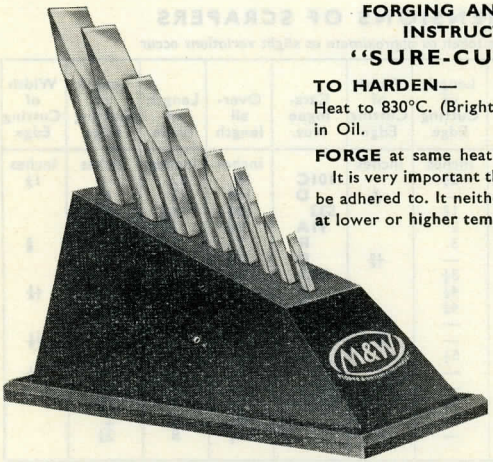
These Chisels are made from a new non-tempering Special Nickel Alloy Steel.

**They can be re-sharpened with a file but are so tough that they will do the hardest work.**

The flat section gives a firm grip, and they will not splinter under severe service.

| | Size of Stock | Width of Cut | Length |
|---|---|---|---|
| No. **319** ... | $\frac{1}{4}$″ × $\frac{5}{32}$″ ... | $\frac{5}{16}$″ ... | 4″ |
| No. **320** ... | $\frac{5}{16}$″ × $\frac{3}{16}$″ ... | $\frac{3}{8}$″ ... | $4\frac{1}{2}$″ |
| No. **321** ... | $\frac{3}{8}$″ × $\frac{7}{32}$″ ... | $\frac{7}{16}$″ ... | 5″ |
| No. **322** ... | $\frac{1}{2}$″ × $\frac{5}{16}$″ ... | $\frac{5}{8}$″ ... | 6″ |
| No. **323** ... | $\frac{5}{8}$″ × $\frac{7}{16}$″ ... | $\frac{3}{4}$″ ... | 7″ |
| No. **324** ... | $\frac{3}{4}$″ × $\frac{1}{2}$″ ... | $\frac{7}{8}$″ ... | 8″ |
| No. **325** ... | $\frac{7}{8}$″ × $\frac{9}{16}$″ ... | 1″ ... | 9″ |
| No. **326** ... | 1″ × $\frac{5}{8}$″ ... | $1\frac{1}{8}$″ ... | 10″ |

Cross-cut Chisels can be supplied in all the above Nos. at **20** per cent. each extra.




## FORGING AND HARDENING INSTRUCTIONS FOR "SURE-CUT" CHISELS

**TO HARDEN—**

Heat to 830°C. (Bright Cherry Red) and quench in Oil.

**FORGE** at same heat.

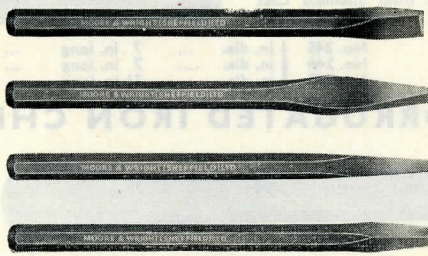
It is very important that the above Temperature be adhered to. It neither forges nor hardens well at lower or higher temperatures.

# OCTAGON CAST STEEL CHISELS

Made from Sheffield **First Quality Cast Steel,** forged and hardened by skilled labour, and guaranteed in every way.

**Shapes supplied are:**

**A—Flat**
**B—Crosscut**
**C—Half-round**
**D—Diamond**



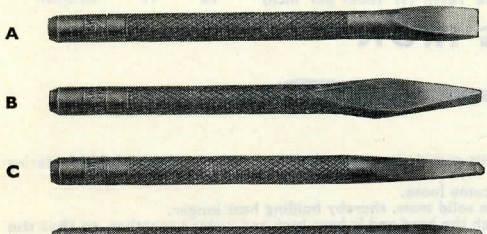

| | Diameter | Length | Cut of Flat Chisels |
|---|---|---|---|
| No. **229** | $\frac{1}{4}$″ ... ... | 4″ ... ... | $\frac{5}{16}$″ |
| No. **230** | $\frac{5}{16}$″ ... ... | $4\frac{1}{2}$″ ... ... | $\frac{3}{8}$″ |
| No. **231** | $\frac{3}{8}$″ ... ... | 5″ ... ... | $\frac{7}{16}$″ |
| No. **232** | $\frac{1}{2}$″ ... ... | 6″ ... ... | $\frac{9}{16}$″ |
| No. **233** | $\frac{5}{8}$″ ... ... | 7″ ... ... | $\frac{3}{4}$″ |
| No. **234** | $\frac{3}{4}$″ ... ... | 8″ ... ... | $\frac{7}{8}$″ |
| No. **235** | $\frac{7}{8}$″ ... ... | 9″ ... ... | 1″ |
| No. **236** | 1″ ... ... | 10″ ... ... | $1\frac{1}{8}$″ |

No. **239** Set of 4, A, B, C, D, $\frac{1}{4}$″ dia.
No. **240** ,, ,, ,, $\frac{5}{16}$″ ,,
No. **241** ,, ,, ,, $\frac{3}{8}$″ ,,
No. **242** ,, ,, ,, $\frac{1}{2}$″ ,,
No. **243** Set of 4 all flat, one each $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{1}{2}$″ dia.

OTHER SIZES AND LENGTHS

| Diameter | | | | | |
|---|---|---|---|---|---|
| $\frac{1}{2}$″ ... | 8″ | 10″ | 12″ long | | |
| $\frac{5}{8}$″ ... | 10″ | 12″ | 15″ | 18″ long | |
| $\frac{3}{4}$″ ... | 10″ | 12″ | 15″ | 18″ | 24″ long |
| $\frac{7}{8}$″ ... | 12″ | 15″ | 18″ | 24″ long | |
| 1″ ... | 8″ | 12″ | 15″ | 18″ | 24″ long |

# ENGINEERS' COLD CHISELS




The Chisels shown above are made of best forged steel; they are hardened and tempered at both ends; are nicely knurled in the middle for a grip, and will be found much better to use and a great improvement on the ordinary plain article.

**Shapes supplied are:**

**A—Flat**
**B—Crosscut**
**C—Half-round**
**D—Diamond**

| | | | | | |
|---|---|---|---|---|---|
| No. **219** | $\frac{1}{4}$″ | dia. | 4″ | long, | any shape |
| No. **220** | $\frac{5}{16}$″ | ,, | $4\frac{1}{2}$″ | ,, | ,, |
| No. **221** | $\frac{3}{8}$″ | ,, | 5″ | ,, | ,, |
| No. **222** | $\frac{1}{2}$″ | ,, | 6″ | ,, | ,, |
| No. **223** | $\frac{5}{8}$″ | ,, | 7″ | ,, | ,, |

No. **209** Set of 4, A, B, C, D, $\frac{1}{4}$″ dia
No. **210** ,, ,, ,, ,, $\frac{5}{16}$″ ,,
No. **211** ,, ,, ,, ,, $\frac{3}{8}$″ ,,
No. **212** ,, ,, ,, ,, $\frac{1}{2}$″ ,,
No. **213** Set of 4 all flat, one each, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{1}{2}$″ dia.

# CORRUGATED IRON PUNCHES

Forged from Sheffield Cast Steel

| | | | | | |
|---|---|---|---|---|---|
| No. **245** | $\frac{1}{2}$ in. dia. | ... | 7 in. long | ... | $\frac{1}{4}$ in. pin |
| No. **246** | $\frac{3}{8}$ in. dia. | ... | 7 in. long | ... | $\frac{5}{16}$ in. pin |
| No. **247** | $\frac{3}{4}$ in. dia. | ... | $7\frac{1}{2}$ in. long | ... | $\frac{7}{16}$ in. pin |

# CORRUGATED IRON CHISELS

Forged from Sheffield Cast Steel

No. **248** $\frac{3}{4}$ in. dia. ... 8 in. long

# TILE CHISEL

No. **214** Assorted : $\frac{5}{16}$″ and $\frac{3}{8}$″ diameters

# OCTAGON CAST STEEL WALL DRILLS

Just the thing for cutting through plaster, brick, etc. Well hardened and tempered.

| | | | |
|---|---|---|---|
| No. **152** | ... | ... | 9″ × $\frac{3}{8}$″ |
| No. **153** | ... | ... | 12″ × $\frac{1}{2}$″ |

# PAD SAW BLADES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. **647** | 7 | 8 | 9 | 10 | 11 | 12 inch. | |
| No. **647A** | With Fine Teeth (17 teeth per inch) | | | | 10 | 11 | 12 inch. |

# SOLDERING IRON

All the old troubles with rivets coming loose are abolished with the shank of this Soldering Iron.

There are NO RIVETS to come loose.

The copper bit is in a more solid mass, thereby holding heat longer.

The Tang goes right through the head and is bent back and welded together, **so that the head can never come off.**

| | Weight of Copper | | | | |
|---|---|---|---|---|---|
| No. **768** | 2 oz. | 10 oz. | 18 oz. | 28 oz. | These Soldering Irons can be supplied hatchet shaped, if required. |
| | 4 oz. | 12 oz. | 20 oz. | 30 oz. | |
| | 6 oz. | 14 oz. | 22 oz. | 32 oz. | |
| | 8 oz. | 16 oz. | 24 oz. | 40 oz. | |

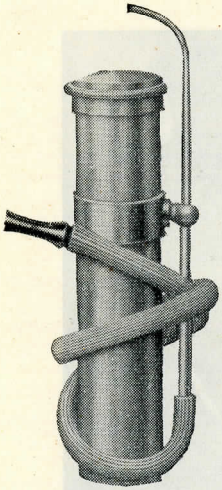
# SELF-FLUXING SOLDER

No. **776** Supplied in dozen lengths.

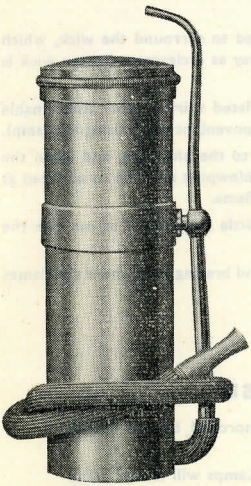
# PLUMBERS' BRASS BLOW LAMPS

The bodies of these lamps are made of specially selected solid drawn tube. The blow pipe is fixed on a sliding spring, which grips the body of the lamp, and adjustments are readily effected. We draw attention to the registered reinforced base.

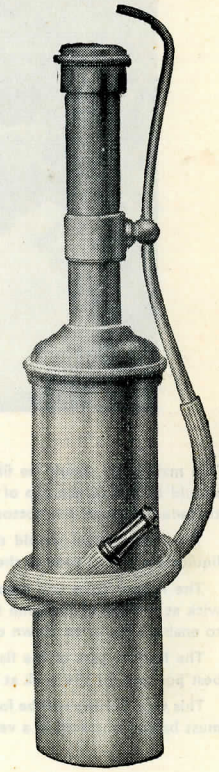
FOR
"HOW TO USE"
SEE PAGE 128



No. **600**
1″ dia. 4⅝″ long overall



No. **602**
1½″ dia. 4⅝″ long overall



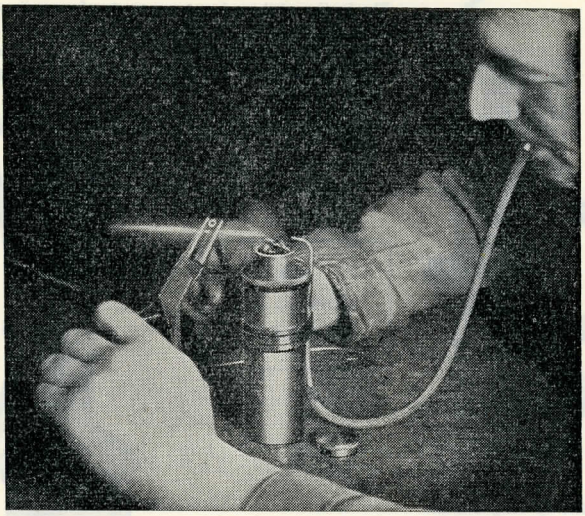
No. **603** 1½″ dia., 7⅜″ long overall

No. **605** 1″ dia., 7⅜″ long overall

No. **606** Brass Blow Pipes only

No. **607** Rubber Tube and Mouthpiece

# HOW TO USE A BLOW LAMP



The main body should be filled with cotton wool so placed to surround the wick, which should be led to the top of the lamp (in just the same way as a cigarette lighter wick is threaded through the cotton wool in the lighter body).

The cotton wool should then be saturated with methylated spirits (other inflammable liquids are not so good as they produce smoke which is inconvenient when using the lamp).

The rubber tube and mouthpiece should be connected to the blowpipe, and when the wick at the top of the lamp has been lit the nozzle of the blowpipe must be so adjusted as to enable a jet to be blown out of the hottest part of the flame.

The hottest part of the flame can easily be found by a little experiment as can also the best position for the wick at the top of the lamp.

This type of lamp will be found ideal for small soldering and brazing jobs where the flames must be concentrated in a very small area.

## REINFORCED BASE

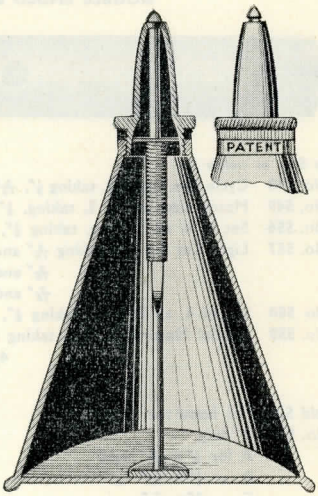
The bases of all our Blow Lamps are greatly improved by the special reinforcement.

They can never leak, never wear out, and the Lamps will always stand upright.

There is no increase in price.

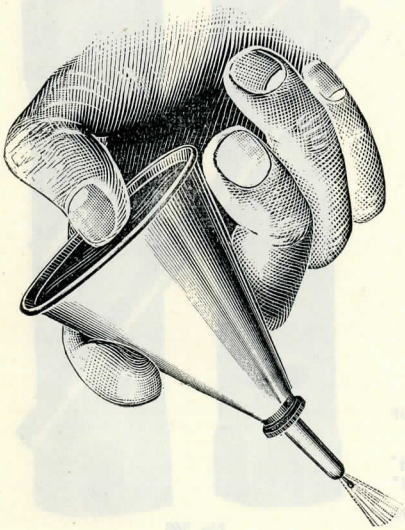
# MOORE'S LEAKPROOF OILCAN

This is the most satisfactory Leak-proof Oilcan on the Market. It is quite automatic, and only requires the pressure of the thumb applied to the base. The body of the can is made from good sound tin plate.




No. **250**
$3\frac{1}{4}$ in. × $2\frac{1}{4}$ in. approximately

**It saves Oil**
**It is Clean**
**It has a Wide Neck**
**Capacity approximately $\frac{1}{5}$ pint**



No. **253** as No. 250, but without patent attachment

# BOX SPANNERS

DOUBLE ENDED STRONG AND RELIABLE

**No. 549**

*In Sets as below :—*

**No. 548** Cycle size, set of 3, taking $\frac{1}{8}$", $\frac{3}{16}$", $\frac{1}{4}$", $\frac{5}{16}$", $\frac{3}{8}$", $\frac{7}{16}$", and tommy, 3" in length

**No. 549** Motor size, set of 3, taking, $\frac{1}{4}$", $\frac{5}{16}$", $\frac{3}{8}$", $\frac{7}{16}$", $\frac{1}{2}$", $\frac{5}{8}$", and tommy, 7" long

**No. 556** Set of 4, all 7" long, taking $\frac{1}{4}$", $\frac{5}{16}$", $\frac{3}{8}$", $\frac{7}{16}$", $\frac{1}{2}$", $\frac{9}{16}$", $\frac{5}{8}$", $\frac{3}{4}$"

**No. 557** Light Car Set of 3 taking $\frac{3}{16}$" and $\frac{1}{4}$" 4" long
$\frac{5}{16}$" and $\frac{3}{8}$" 5" long
$\frac{7}{16}$" and $\frac{1}{2}$" 6" long

**No. 558** Set of 4, all 7" long, taking $\frac{1}{8}$", $\frac{3}{16}$", $\frac{1}{4}$", $\frac{5}{16}$", $\frac{3}{8}$", $\frac{7}{16}$", $\frac{1}{2}$", $\frac{9}{16}$"

**No. 559** Special Motor Set of 3, taking $\frac{1}{4}$" $\frac{5}{16}$" $\frac{3}{8}$" $\frac{7}{16}$" $\frac{1}{2}$" $\frac{5}{8}$"
$4\frac{1}{2}$" long 5" long $5\frac{1}{2}$" long

*Sold Singly as below :—*

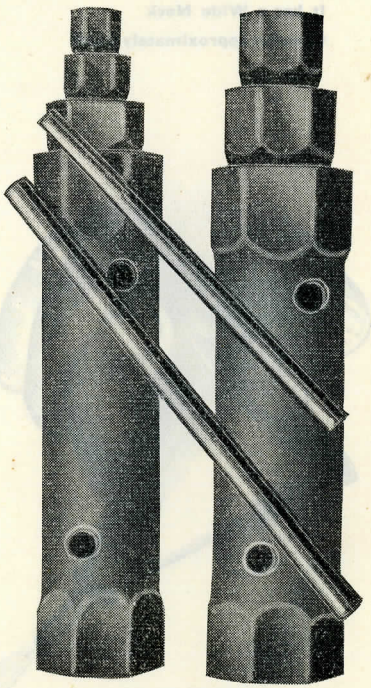
**No. 548** 3" long
A for $\frac{1}{8}$" × $\frac{3}{16}$" nuts
B ,, $\frac{1}{4}$" × $\frac{5}{16}$" ,,
C ,, $\frac{3}{8}$" × $\frac{7}{16}$" ,,

**No. 540** 7" long
A for $\frac{1}{8}$" × $\frac{3}{16}$" nuts
B ,, $\frac{3}{16}$" × $\frac{1}{4}$" ,,
C ,, $\frac{1}{4}$" × $\frac{5}{16}$" ,,
D ,, $\frac{5}{16}$" × $\frac{3}{8}$" ,,
E ,, $\frac{3}{8}$" × $\frac{7}{16}$" ,,
F ,, $\frac{3}{8}$" × $\frac{1}{2}$" ,,
G ,, $\frac{7}{16}$" × $\frac{1}{2}$" ,,
H ,, $\frac{1}{2}$" × $\frac{9}{16}$" ,,
J ,, $\frac{9}{16}$" × $\frac{11}{16}$" ,,
K ,, $\frac{1}{2}$" × $\frac{5}{8}$" ,,
L ,, $\frac{5}{8}$" × $\frac{9}{16}$" ,,
M ,, $\frac{5}{8}$" × $\frac{3}{4}$" ,,
N ,, $\frac{3}{4}$" × $\frac{7}{8}$" ,,
O ,, $\frac{7}{8}$" × 1" ,,
P ,, 1" × $1\frac{1}{8}$" ,,
Q ,, 1" × $1\frac{1}{4}$" ,,
R ,, $1\frac{1}{8}$" × $1\frac{1}{4}$" ,,
S ,, $1\frac{1}{4}$" × $1\frac{1}{2}$" ,,

**No. 560** SPECIAL ENGINEERS' SET OF 7 SPANNERS

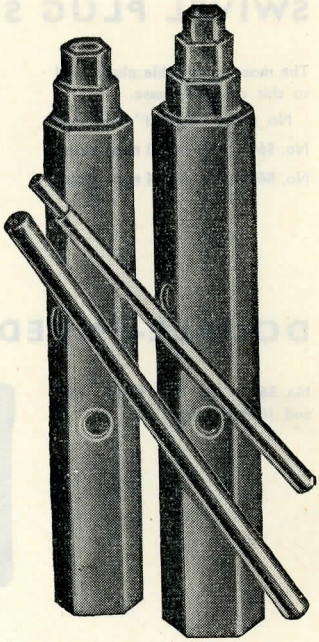
I each taking $\frac{3}{16}$" × $\frac{1}{4}$", $\frac{5}{16}$" × $\frac{3}{8}$", $\frac{7}{16}$" × $\frac{1}{2}$" $\frac{9}{16}$" × $\frac{5}{8}$", $\frac{11}{16}$" × $\frac{3}{4}$", $\frac{13}{16}$" × $\frac{7}{8}$", $\frac{15}{16}$" × 1"

All 7 in. long 2 Tommy Bars



**No. 560**

# HEXAGON BOX SPANNERS



These Spanners have at least ten times the life of the ordinary type of Box Spanner. As the ends become distorted by wear, the worn portion can be ground, or cut off, thus bringing into use an entirely new surface of correct size. This process can be repeated many times and **it saves the cost of a new spanner every time it is done.**

The Set detailed herewith is offered as a most useful Set for Motorists, etc.

No. **525** Set of 7, i.e., One Spanner each, taking nuts of $\frac{1}{8}$", $\frac{3}{16}$", $\frac{1}{4}$", $\frac{5}{16}$", $\frac{3}{8}$", $\frac{7}{16}$" and $\frac{1}{2}$" Whitworth.

No **524** Set of 4, i e., One Spanner each, taking nuts of $\frac{1}{8}$", $\frac{3}{16}$", $\frac{1}{4}$", and $\frac{5}{16}$" Whitworth

### SINGLE SPANNERS

No. **523** $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{9}{16}$ $\frac{5}{8}$ $\frac{11}{16}$ $\frac{3}{4}$ inch

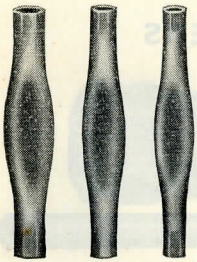
# HEXAGON DRAWN STEEL TUBING

IN 2 FOOT LENGTHS

No. **522**—

The sizes given are the sizes of Whitworth Bolt Head the tube will take.

$\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{9}{16}$ $\frac{5}{8}$ $\frac{11}{16}$ $\frac{3}{4}$ inch



# WIRELESS BOX SPANNERS

No. **544** Set of three, covering all sizes from 1 to 6, B A.

No. **544/A** For B.A. 1 and 2

No. **544/B** For B.A. 3 and 5

No. **544/C** For B.A. 4 and 6

All sizes same price

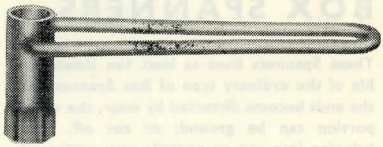
## SWIVEL PLUG SPANNERS

The most untractable plugs yield to this tool with ease.

No more "barked" knuckles.

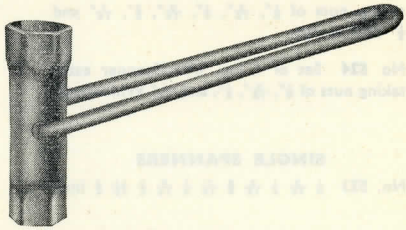
No. **564** To fit 18 mm. plugs.

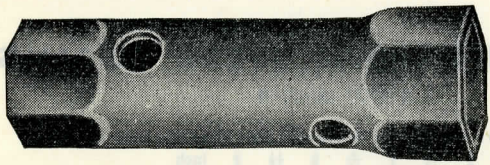
No. **564D** To fit 14 mm. plugs.



## DOUBLE-ENDED PLUG SPANNERS

No. **565** To fit 14 mm. and and 18 mm. plugs.





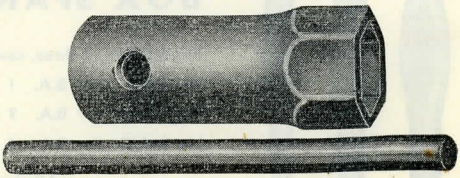
No. **539** To fit 14 mm. and 18 mm. plugs.

Complete with Tommy Bar.

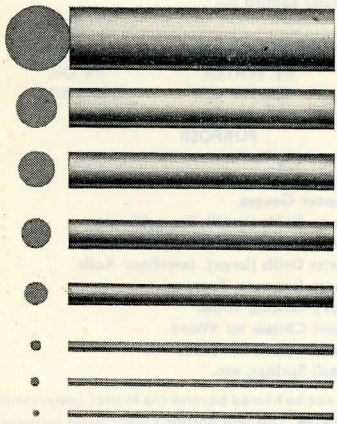
## SPARKING PLUG SPANNERS

No. **546A** To fit 18 mm. plugs.

No. **546D** To fit 14 mm. plugs.



# "MOORITE" SILVER STEEL
## IN 13 in. LENGTHS



| No. 196 | | Approx. number of feet in 1 lb. |
|---|---|---|
| Inch | decimal | |
| 1/32 | ·0312 | 385 |
| 3/64 | ·0468 | 167 |
| 1/16 | ·0625 | 95 |
| 5/64 | ·0781 | 60 |
| 3/32 | ·0938 | 43 |
| 7/64 | ·1094 | 31 |
| 1/8 | ·125 | 24 |
| 9/64 | ·1406 | 18 |
| 5/32 | ·1562 | 15 |
| 11/64 | ·1718 | 13 |
| 3/16 | ·1875 | 10 |
| 13/64 | ·2031 | 9 |
| 7/32 | ·2187 | 7 |
| 15/64 | ·2344 | 6·5 |
| 1/4 | ·250 | 6 |
| 9/32 | ·2812 | 4·5 |
| 5/16 | ·3125 | 3·75 |
| 11/32 | ·3438 | 3 |
| 3/8 | ·375 | 2 |
| 7/16 | ·4375 | 2 |
| 1/2 | ·500 | 1·5 |
| 9/16 | ·5625 | 1 full |
| 5/8 | ·625 | 1 bare |
| 11/16 | ·687 | ·79 |
| 3/4 | ·750 | ·66 |
| 13/16 | ·812 | ·57 |
| 7/8 | ·875 | ·49 |
| 1 | 1 | ·38 |

### SPECIAL NOTE

When any size of Silver Steel is ordered, **except fractional sizes,** it saves time and possible errors to give the sizes in thousandths of an inch. Avoid ordering in gauge sizes, as owing to the large number of Gauges in use, errors may ensue.

**SILVER STEEL** can also be supplied as follows :

No. **193** Parcel of 1-lb. assorted.

No. **194** Parcel of 2-lb. assorted.

No. **194A** Box containing one length each 1/16" to 1/4" rising by 64ths, plus one length each 9/32", 5/16", 3/8". 16 lengths in all.

# SILVER STEEL

Silver Steel is of the Crucible Carbon Tool Steel variety and is not an Alloy Steel in the general sense. It is particularly free from all impurities such as Sulphur, Phosphorus and slag inclusions.

It machines easily and smoothly and can be used in its natural state as supplied, or it can be hardened and tempered to suit requirements. By different treatment a very wide variation in physical characteristics can be obtained, and for this reason it is particularly suitable for general purposes.

It can be used for the production of small tools, taps, punches, drills, instruments and meter parts, and small machine parts.

We give you below heat treatment instructions and Rockwell Hardnesses for the various purposes to which Silver Steel may be successfully applied :—

## QUENCHING TEMPERATURES

| **Hardening:** | IN WATER | IN OIL |
|---|---|---|
| | 750/770°C. | 770/790°C. |

| **Tempering:** Tempered at | ROCKWELL C. Scale | PURPOSE |
|---|---|---|
| 200° C. | 64 | Engraving Tools. |
| 210° C. | 63 | Scrapers and small Lathe Tools. |
| 220° C. | 62 | Master Gauges. |
| 230° C. | 61 | Twist Drills (small), Taps, Chasers. |
| 240° C. | 60 | Twist Drills (med. size), Reamers. |
| 250° C. | 59 | Twist Drills (large), Jewellers' Rolls. |
| 260° C. | 58 | Large Reamers, Taps, etc. |
| 270° C. | 57 | Ivory Cutting Tools. |
| 280° C. | 56 | Hand Chisels for Wood. |
| 290° C. | 55 | Hand Chisels for Steel. |
| 300° C. | 54 | Small Springs, etc. |

**Heating for Hardening.**—Silver Steel should not be heated beyond the lowest temperature at which it will satisfactorily harden, as given above. This will ensure a finer grain structure being obtained and will result in the tools giving maximum service. Do not force the hardening temperature up quickly, but let the tool get hot gradually. It is preferable to heat the tool in a muffle, if possible, as more uniform temperatures are obtained.

**Quenching.**—Intricate Cutters and articles such as Milling Cutters, which are liable to crack can, with advantage, be quenched in warm water approximately 80/100°C.

**Tempering.**—Oil Baths are preferable for the tempering operation, as very uniform and exact results can be obtained.

**Re-Hardening.**—When hardened tools require re-hardening be sure to see that the tool is annealed correctly before being re-hardened. This will minimise the risk of breakage caused through internal hardening strains.

## EXPANSION OF SILVER STEEL

| | Co-efficient of linear Expansion per 1°C. |
|---|---|
| **Annealed Condition** | |
| 110° C. | ·0000052 |
| 210° C. | ·0000067 |
| **Hardened Condition** | |
| 110° C. | ·0000097 |
| 210° C. | ·0000098 |

## DECIMAL EQUIVALENT OF STEEL WIRE GAUGE

| Letter | Size of Letter in Decimals | No. of Wire Gauge | Size of Number in Decimals | No. of Wire Gauge | Size of Number in Decimals | No. of Wire Gauge | Size of Number in Decimals |
|---|---|---|---|---|---|---|---|
| Z | ·413 | 1 | ·227 | 28 | ·139 | 55 | ·050 |
| Y | ·404 | 2 | ·219 | 29 | ·134 | 56 | ·045 |
| X | ·397 | 3 | ·212 | 30 | ·127 | 57 | ·042 |
| W | ·386 | 4 | ·207 | 31 | ·120 | 58 | ·041 |
| V | ·377 | 5 | ·204 | 32 | ·115 | 59 | ·040 |
| U | ·368 | 6 | ·201 | 33 | ·112 | 60 | ·039 |
| T | ·358 | 7 | ·199 | 34 | ·110 | 61 | ·038 |
| S | ·348 | 8 | ·197 | 35 | ·108 | 62 | ·037 |
| R | ·339 | 9 | ·194 | 36 | ·106 | 63 | ·036 |
| Q | ·332 | 10 | ·191 | 37 | ·103 | 64 | ·035 |
| P | ·323 | 11 | ·188 | 38 | ·101 | 65 | ·033 |
| O | ·316 | 12 | ·185 | 39 | ·099 | 66 | ·032 |
| N | ·302 | 13 | ·182 | 40 | ·097 | 67 | ·031 |
| M | ·295 | 14 | ·180 | 41 | ·095 | 68 | ·030 |
| L | ·290 | 15 | ·178 | 42 | ·092 | 69 | ·029 |
| K | ·281 | 16 | ·175 | 43 | ·088 | 70 | ·027 |
| J | ·277 | 17 | ·172 | 44 | ·085 | 71 | ·026 |
| I | ·272 | 18 | ·168 | 45 | ·081 | 72 | ·024 |
| H | ·266 | 19 | ·164 | 46 | ·079 | 73 | ·023 |
| G | ·261 | 20 | ·161 | 47 | ·077 | 74 | ·022 |
| F | ·257 | 21 | ·157 | 48 | ·075 | 75 | ·020 |
| E | ·250 | 22 | ·155 | 49 | ·072 | 76 | ·018 |
| D | ·246 | 23 | ·153 | 50 | ·069 | 77 | ·016 |
| C | ·242 | 24 | ·151 | 51 | ·066 | 78 | ·015 |
| B | ·238 | 25 | ·148 | 52 | ·063 | 79 | ·014 |
| A | ·234 | 26 | ·146 | 53 | ·058 | 80 | ·013 |
| | | 27 | ·143 | 54 | ·055 | | |

STUBS' GAUGES.—In using the gauges known as Stubs' Gauges, there should be constantly borne in mind the difference between the Stubs' Iron Wire Gauge and the Stubs' Steel Wire Gauge. The Stubs' Iron Wire Gauge is the one commonly known as the Birmingham Gauge, and designates the Stubs' soft wire sizes. The Stubs' Steel Wire Gauge is the one that is used in measuring Drawn Steel Wire.

## THE INTERNATIONAL STANDARD METRIC SYSTEM

**Note.**–*The French Thread is being gradually displaced by the International Standard Metric Thread*

| Diameter in mm. | Pitch in mm. | | Diameter in mm. | Pitch in mm. | | Diameter in mm. | Pitch in mm. | |
|---|---|---|---|---|---|---|---|---|
| | International Standard | French Standard | | International Standard | French Standard | | International Standard | French Standard |
| 2 | ·4 | — | 27 | 3·0 | — | 72 | 6·0 | — |
| 3 | ·5 | ·5 | 28 | — | 3·0 | 76 | 6·0 | — |
| 4 | ·7 | ·75 | 30 | 3·5 | 3·5 | 80 | 6·0 | — |
| 5 | ·8 | ·75 | 32 | — | 3·5 | 84 | 6·0 | — |
| 6 | 1·0 | 1·0 | 33 | 3·5 | — | 89 | 6·0 | — |
| 7 | 1·0 | 1·0 | 34 | — | 3·5 | 94 | 6·0 | — |
| 8 | 1·25 | 1·0 | 36 | 4·0 | 4·0 | 99 | 6·0 | — |
| 9 | 1·25 | 1·0 | 38 | — | 4·0 | 104 | 6·0 | — |
| 10 | 1·5 | 1·5 | 39 | 4·0 | — | 109 | 6·0 | — |
| 11 | 1·5 | — | 40 | — | 4·0 | 114 | 6·0 | — |
| 12 | 1·75 | 1·5 | 42 | 4·5 | 4·5 | 119 | 6·0 | — |
| 14 | 2·0 | 2·0 | 45 | 4·5 | — | 124 | 6·0 | — |
| 16 | 2·0 | 2·0 | 48 | 5·0 | — | 129 | 6·0 | — |
| 18 | 2·5 | 2·5 | 52 | 5·0 | — | 134 | 6·0 | — |
| 20 | 2·5 | 2·5 | 56 | 5·5 | — | 139 | 6·0 | — |
| 22 | 2·5 | 2·5 | 60 | 5·5 | — | 144 | 6·0 | — |
| 24 | 3·0 | 3·0 | 64 | 6·0 | — | | | |
| 26 | — | 3·0 | 68 | 6·0 | — | | | |

## DECIMAL EQUIVALENTS OF MILLIMETRES AND FRACTIONS OF mm.

| mm. | Inches | mm. | Inches | mm. | Inches | mm. | Inches | mm. | Inches |
|---|---|---|---|---|---|---|---|---|---|
| 1/100 = | ·00039 | 26/100 = | ·01024 | 51/100 = | ·02008 | 76/100 = | ·02992 | 2 = | ·07874 |
| 2/100 = | ·00079 | 27/100 = | ·01063 | 52/100 = | ·02047 | 77/100 = | ·03032 | 3 = | ·11811 |
| 3/100 = | ·00118 | 28/100 = | ·01102 | 53/100 = | ·02087 | 78/100 = | ·03071 | 4 = | ·15748 |
| 4/100 = | ·00157 | 29/100 = | ·01142 | 54/100 = | ·02126 | 79/100 = | ·03110 | 5 = | ·19685 |
| 5/100 = | ·00197 | 30/100 = | ·01181 | 55/100 = | ·02165 | 80/100 = | ·03150 | 6 = | ·23622 |
| 6/100 = | ·00236 | 31/100 = | ·01220 | 56/100 = | ·02205 | 81/100 = | ·03189 | 7 = | ·27559 |
| 7/100 = | ·00276 | 32/100 = | ·01260 | 57/100 = | ·02244 | 82/100 = | ·03228 | 8 = | ·31496 |
| 8/100 = | ·00315 | 33/100 = | ·01299 | 58/100 = | ·02283 | 83/100 = | ·03268 | 9 = | ·35433 |
| 9/100 = | ·00354 | 34/100 = | ·01339 | 59/100 = | ·02323 | 84/100 = | ·03307 | 10 = | ·39370 |
| 10/100 = | ·00394 | 35/100 = | ·01378 | 60/100 = | ·02362 | 85/100 = | ·03346 | 11 = | ·43307 |
| 11/100 = | ·00433 | 36/100 = | ·01417 | 61/100 = | ·02402 | 86/100 = | ·03386 | 12 = | ·47244 |
| 12/100 = | ·00472 | 37/100 = | ·01457 | 62/100 = | ·02441 | 87/100 = | ·03425 | 13 = | ·51181 |
| 13/100 = | ·00512 | 38/100 = | ·01496 | 63/100 = | ·02480 | 88/100 = | ·03465 | 14 = | ·55118 |
| 14/100 = | ·00551 | 39/100 = | ·01535 | 64/100 = | ·02520 | 89/100 = | ·03504 | 15 = | ·59055 |
| 15/100 = | ·00591 | 40/100 = | ·01575 | 65/100 = | ·02559 | 90/100 = | ·03543 | 16 = | ·62992 |
| 16/100 = | ·00630 | 41/100 = | ·01614 | 66/100 = | ·02598 | 91/100 = | ·03583 | 17 = | ·66929 |
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| 18/100 = | ·00709 | 43/100 = | ·01693 | 68/100 = | ·02677 | 93/100 = | ·03661 | 19 = | ·74803 |
| 19/100 = | ·00748 | 44/100 = | ·01732 | 69/100 = | ·02717 | 94/100 = | ·03701 | 20 = | ·78740 |
| 20/100 = | ·00787 | 45/100 = | ·01772 | 70/100 = | ·02756 | 95/100 = | ·03740 | 21 = | ·82677 |
| 21/100 = | ·00827 | 46/100 = | ·01811 | 71/100 = | ·02795 | 96/100 = | ·03780 | 22 = | ·86614 |
| 22/100 = | ·00866 | 47/100 = | ·01850 | 72/100 = | ·02835 | 97/100 = | ·03819 | 23 = | ·90551 |
| 23/100 = | ·00906 | 48/100 = | ·01890 | 73/100 = | ·02874 | 98/100 = | ·03858 | 24 = | ·94488 |
| 24/100 = | ·00945 | 49/100 = | ·01929 | 74/100 = | ·02913 | 99/100 = | ·03898 | 25 = | ·98425 |
| 25/100 = | ·00984 | 50/100 = | ·01969 | 75/100 = | ·02953 | 1 = | ·03937 | 26 = | 1·02362 |

### TO TEST STEEL AND IRON

Nitric Acid will produce a black spot on steel; the darker the spot the harder the steel. Iron, on the contrary, remains bright if touched with nitric acid. Good steel in its soft state has a curved fracture and a uniform grey lustre; in its hard state a dull, silvery uniform white. Cracks, threads or sparkling particles denote bad quality.

A white heat will ruin good steel, and it cannot be forged under the hammer at a bright red heat, but it is most ductile at a moderate heat. When hardened in water the strength of steel is reduced, but is increased in strength and toughness by being hardened in oil.

Case-hardening weakens bolts.

## IMPERIAL STANDARD WIRE GAUGE

| No. of Wire Gauge | Inches | No. of Wire Gauge | Inches | No. of Wire Gauge | Inches | No. of Wire Gauge | Inches |
|---|---|---|---|---|---|---|---|
| 000000 | ·464 | 7 | ·176 | 19 | ·040 | 30 | ·0124 |
| 00000 | ·432 | 8 | ·160 | 20 | ·036 | 31 | ·0116 |
| 0000 | ·400 | 9 | ·144 | 21 | ·032 | 32 | ·0108 |
| 000 | ·372 | 10 | ·128 | 22 | ·028 | 33 | ·0100 |
| 00 | ·348 | 11 | ·116 | 23 | ·024 | 34 | ·0092 |
| 0 | ·324 | 12 | ·104 | 24 | ·022 | 35 | ·0084 |
| 1 | ·300 | 13 | ·092 | 25 | ·020 | 36 | ·0076 |
| 2 | ·276 | 14 | ·080 | 26 | ·018 | 37 | ·0068 |
| 3 | ·252 | 15 | ·072 | 27 | ·0164 | 38 | ·0060 |
| 4 | ·232 | 16 | ·064 | 28 | ·0149 | 39 | ·0052 |
| 5 | ·212 | 17 | ·056 | 29 | ·0136 | 40 | ·0048 |
| 6 | ·192 | 18 | ·048 | | | | |

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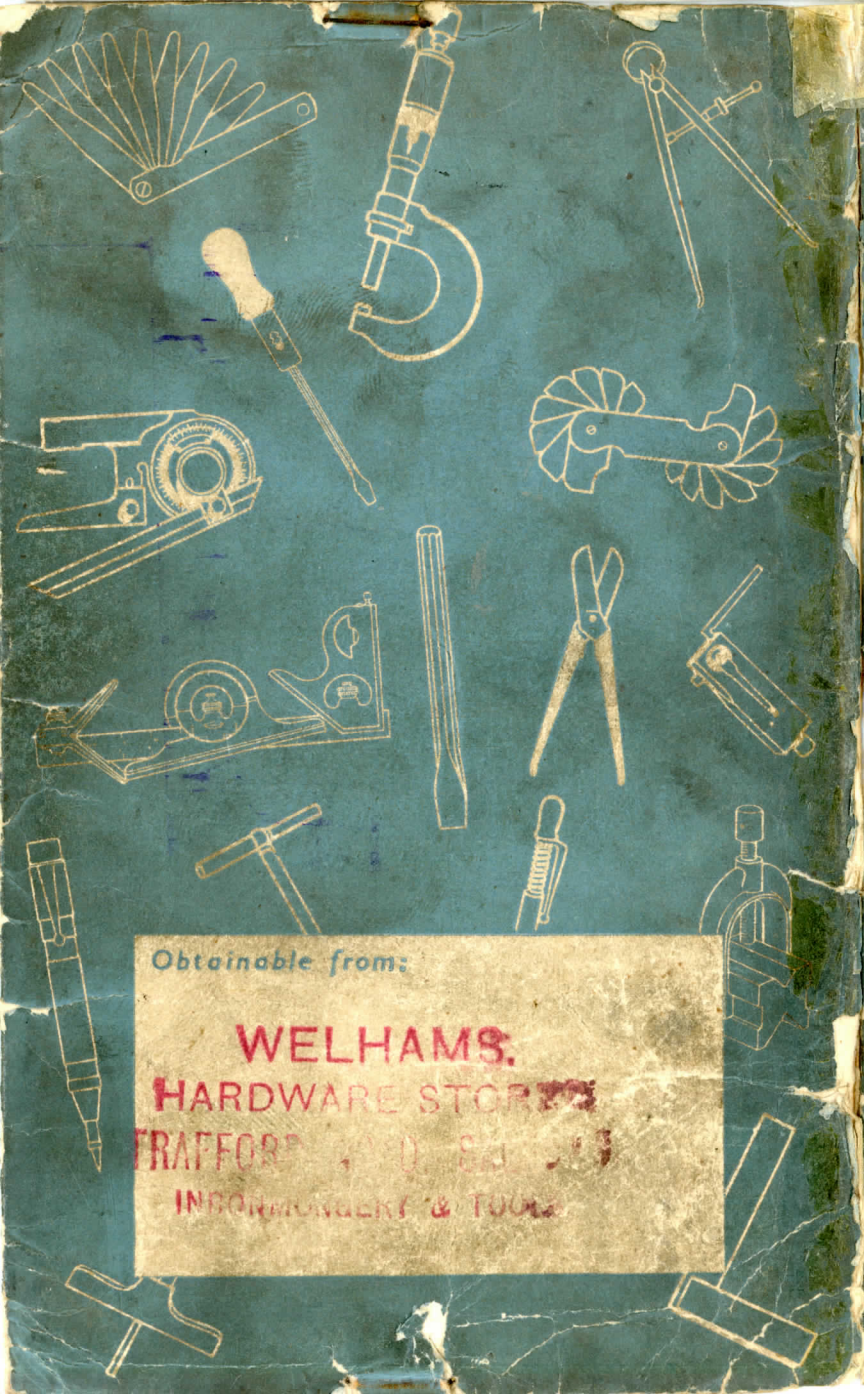

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